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ZEOS
Desktop and Vertical Systems
User's Guide

The information contained in this User's Guide is subject to change without notice. Should you encounter problems or need assistance, refer to your Before Calling ZEOS Handbook.

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About This Guide

Welcome to ZEOS

Thank you for purchasing a ZEOS computer. We are certain you will be pleased with your choice. Please let us know if you have questions or comments about our product. We enjoy hearing from you. Only by listening to our customers can we continue to provide the products and services that make ZEOS one of America's fastest growing computer manufacturers.

If you have questions about your system, refer to Appendix A, Getting Help for technical support, sales, and customer service telephone numbers.

ZEOS computer technical support representatives stand ready to help. However, to provide the best possible service for all of our customers, we request that you refer to your Before Calling Technical Support Handbook prior to calling. Most often, the answers to your questions are contained in this handbook.

As you would expect, ZEOS technical support representatives have a strong working knowledge of ZEOS computer systems. While we stand ready to assist you in any way we can, questions related to applications software you may have purchased elsewhere are best answered by the software publishers themselves.

Danger

- Do not use the system near water; for example, a bathtub, washbowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool.
- Do not place the system on an unstable cart, stand, or table. It may fall, causing serious injury to a child or adult, or serious damage to the monitor.
- Slots and openings are provided for ventilation, and to ensure reliable operation of the system and to protect it from overheating. The opening should never be blocked by placing the system on a bed, sofa, rug, or similar surface.
- The system should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your home, consult your electrician or local power company.
- Never push objects of any kind into the slots and openings as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock.
- For added protection, during a lightening storm or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the system due to lightening and power-line surges.
- Electro Static Discharge (ESD). Many of the computer system's internal components are extremely sensitive to static electricity. Discharge your body's static-electric charge by touching a grounded surface (such as, touching the computer chassis if the power connector is connected to a three-prong wall outlet or surge supressor) before performing any internal adjustments and/or changes.

What's in Each Chapter

Chapter 1 — System Overview

This chapter is divided into the following sections:

- Section 1 — Before You Unpack
- Section 2 — Unpacking The System
- Section 3 — Setting Up The System
- Section 4 — Starting Up The System
- Section 5 — Using The System

This chapter offers suggestions for setting up a work area that is environmentally safe for your computer. There are procedures for unpacking your system, and connecting various system components. There are also instructions how to get your system up and running, how to power up your system and what happens internally during this power up process. There are instructions that explain how to restart your computer and information about when and why this may be necessary.

Chapter 2 — The Hard Drive

This chapter contains general information about hard drives and how to configure the hard drive.

Chapter 3 — The Floppy Drive

This chapter contains general information about floppy disks and the floppy disk drives (e.g., handling, formatting, capacity, etc.). It also describes how to connect, and configure the floppy drive.

Chapter 4 — The Keyboard

This chapter offers information about your keyboard, how special keys function in most applications, and general purpose of each key.

Chapter 5 — Mainboard Operations

> **Note:** Insert your Mainboard Operations Manual (supplied with your system) after the chapter cover page.

This chapter contains general specifications and functional descriptions of port, connectors and jumpers. It also contains detailed information about using the system SETUP utility.

Chapter 6 — The Monitor

This chapter contains general information about monitors, how they work, and how to connect it.

Chapter 7 — Expanding Your System

This chapter provides general information about expanding your system and the steps used to add more memory and peripheral devices to your system. It also contains cover removal and battery changing procedures.

Chapter 8 — MS-DOS Overview

This section explain basic MS-DOS concepts and introduces the most commonly used commands.

Appendix A — Getting Help

This appendix contains ZEOS's sales, technical support, and customer service telephone numbers.

Glossary

This is a mini-dictionary of terms that you will find in this manual and elsewhere. It will help you identify the components and peripherals that make up your system.

Conventions

The conventions that are used in this manual are:

Keyboard commands to enter for performing specific functions or executing programs. Examples of how keyboard commands and their results will appear:

```
c:> copy a:*.*
```

Specific keys to press are highlighted in bold text. Such as:

Enter, F3, PgUp

Specific keys to press simultaneously are highlighted in **bold** and have a + (plus sign) separating them. Such as:

Ctrl+Alt+Delete

User optional functions, filenames, directories, etc. are enclosed in ( ), such as: (filename)

Filenames and commands are listed in uppercase letters, such as: AUTOEXEC.BAT

Danger

Identifies situations that will cause death, severe personal injury, or damage to your system.

Warning

Identifies situations that can cause death, severe personal injury, or damage to your system.

Caution

Identifies situations that can or will cause death, severe personal injury, or damage to your system.

Note: Identifies information that you should know and be aware of as you use your system.

Related Documentation

There are other user's guides supplied with your system. These guides are specific to the equipment and/or application that came with or was purchased as an option for your system. These guides and/or disks provide you with specific information for installing and using this equipment.

FCC Compliance Statement

For U.S. and Canadian Users

Danger

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is needed.
- Consult the dealer or an experienced radio/TV technician for help.

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment.

This equipment is a Class B digital apparatus which complies with the Radio Interference Regulations, C.R.C., c. 1374.

Cet appareil numèrique de la classe B est conformè au Règlement sur le brouillage radioèlèctrique, C.R.C., ch. 1374.

Danger

The power supply cord serves as a complete disconnect device. In case of emergency or when servicing your system, disconnect the power cord from the power supply or outlet. For your safety, position the system near the supply socket or outlet and ensure that it is easily accessable at all times.

WARNUNG

Die Netzanschlußleitung kann als eine Trennung zum Versorgungsnetz dienen. Im Notfall, oder wenn Sie das Gerät warten, zeihen Sie den Gerätestecker der Netzanschßleitung aus der Steckdose. Zu Ihrer Sicherheit, stellen Sie das Gerät neben der Steckdose auf und vergewissern sich, daß der Gerätestecker immer leicht zu erreichen ist.

Chapter 1 — System Overview

This chapter is divided into the following sections:

- Section 1 — Before You Unpack
- Section 2 — Unpacking The System
- Section 3 — Setting Up The System
- Section 4 — Starting Up The System
- Section 5 — Using The System

Section 1 — Before You Unpack

Before you start unpacking, take a few minutes to decide where and how you will set up your work area. Your ZEOS computer system was designed to give many years of trouble-free service. However, you should provide the same care and protection that you would provide any type of electronic equipment.

Use the following guidelines to help you determine where to set up your system:

- Avoid areas with high levels of dust, smoke and dirt. Over a period of time, dust and dirt can filter into your system.
- Avoid direct sunlight. Your computer is vulnerable to excessive temperature changes.
- Choose an area with adequate ventilation and make sure there is sufficient room around your computer for air to circulate freely.

Danger

Never block the cooling fan openings. Over heating can cause damage and shorten the life of your system.

- Make sure your electrical outlets are close enough to your system so tripping over extension cords is not a problem.
- Choose a place with relatively little traffic. Bumps and sudden jolts are a hazard to your computer.

Section 2 — Unpacking Your System

Danger

Before restarting your system, allow the system to warm up to room temperature for at least 24 hours if it has been exposed to extremely hot or cold conditions. Extreme cold forms condensation as the system adjusts to room temperature that could cause electrical and/or component failures. If condensation forms, do not power on the system until the accumulated condensation has evaporated.

If possible, unpack your system in or near the area where your system will be located. Clear the work area as much as possible so you have plenty of room.

Take everything out of the packing boxes and remove all the wrappings and packing materials. As you unpack, verify that you have received everything listed on your packing list.

> **Note:** Ensure that when you remove all items from the large packaging container that you don't over look system components that are packed in the specially designed, packaging container.

If any items appear to be damaged or missing, contact a ZEOS Customer Service Consultant immediately (refer to Appendix A, Getting Help.

> **Note:** Do not discard the packing boxes and inserts. If you ever need to move your system or return any of the components, these are the only containers that are approved for transport.

Place the computer unit on the surface you have chosen. For now, make sure the back of the computer is exposed. You will need to see and have easy access to the electrical connection and the ports for connecting your peripherals.

Section 3 — Setting Up The System

This section explains how to:

- Identify basic system components
- Identify various types of device connectors
- Connect your peripheral devices.
- Locate MS-DOS

Basic System Components

The following information describes a basic system's components. For more technical information about each of these system components, refer to the appropriate chapter/section in this guide or the supplied manufacturer's user's guide.

Computer

The peripheral devices for your system (e.g., monitor, keyboard, printer, mouse) connect to this unit (often referred to as the CPU or system unit). Generally, this unit houses the hard drives, the floppy drives, the mainboard (often referred to as the motherboard), and various optional expansion boards. However, each ZEOS system may be customized to match your needs. For example, you may want two hard drives and the ability to connect more than one printer. Refer to Chapter 5, Mainboard Operations for more detailed information about your system's input/output capabilities.

Power Cord

The three-prong plug connects your computer with a grounded electrical outlet. If you do not have a properly grounded outlet, have one installed.

Keyboard

The keyboard is used to enter commands, or input information into the computer's memory. Refer to Chapter 4, The Keyboard for more specific information about the various keyboard groups and special keys.

Monitor

The monitor displays input and output to and from your computer. For general information, refer to Chapter 6, The Monitor. Refer to the supplied monitor user's guide for more detailed information.

Mouse

A mouse is a pointing device that allows you to select items and choose commands from the screen. Refer to the supplied mouse user's guide for detailed information about the mouse.

Before Calling ZEOS Technical Support Handbook

This handbook provides basic troubleshooting techniques that must be used before calling ZEOS technical support for technical assistance.

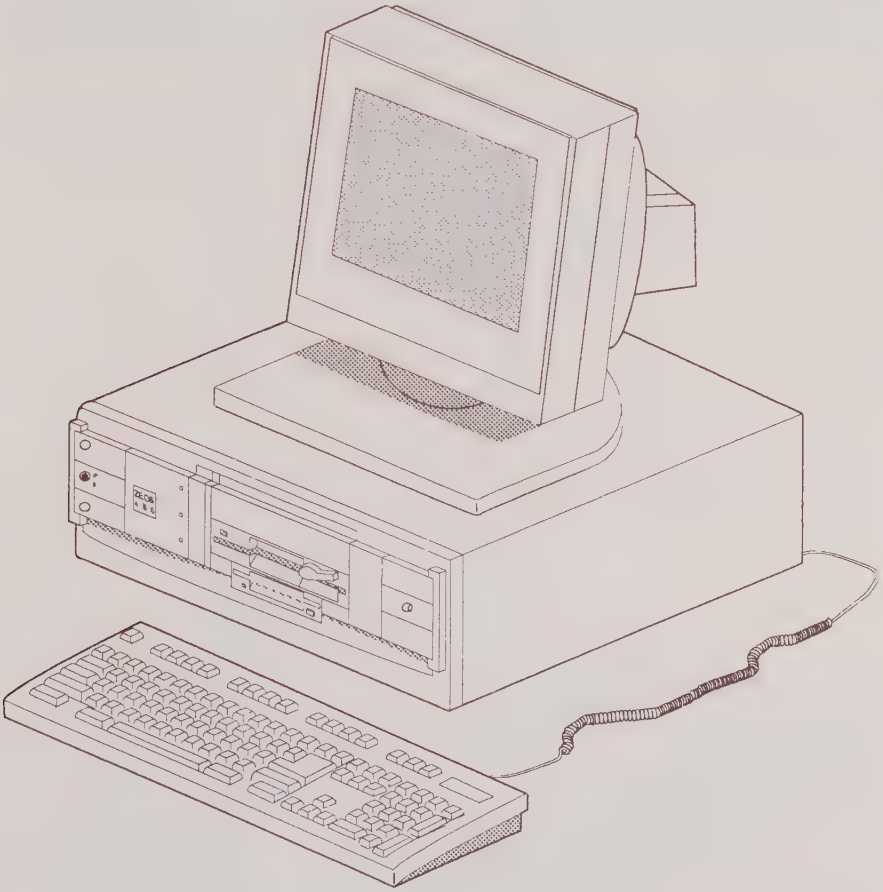


Figure 1-3-1. Typical Desktop System

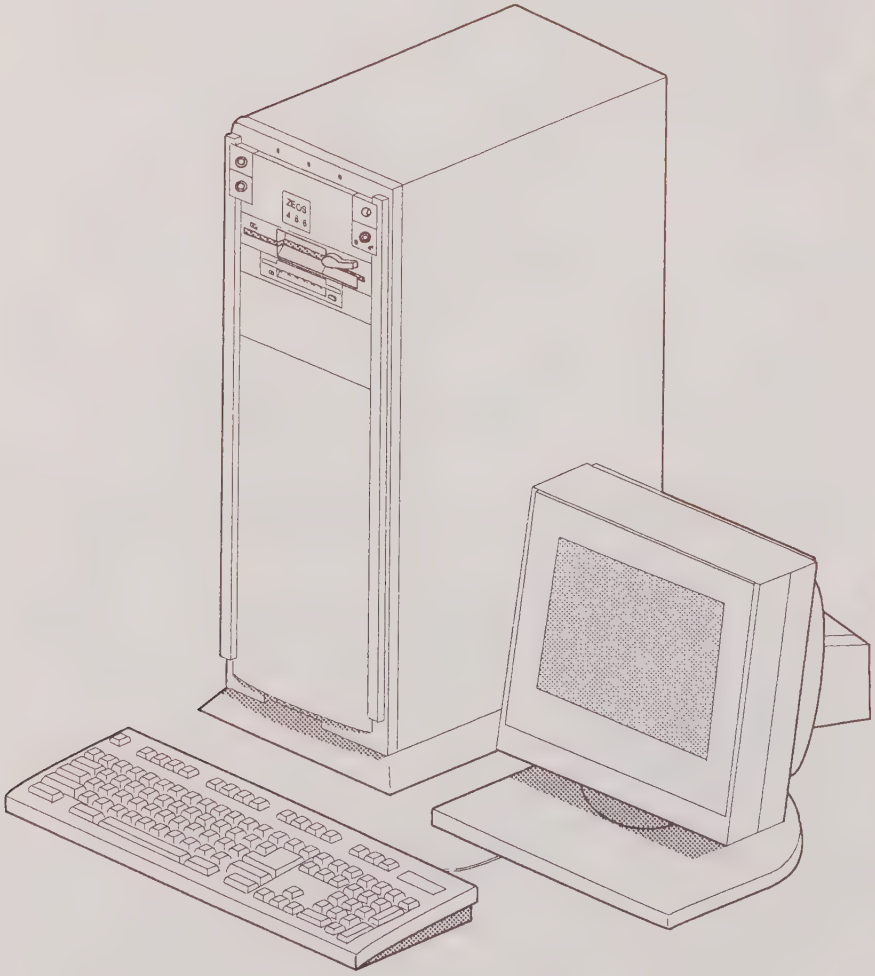


Figure 1-3-2. Typical Vertical System

Before You Begin

Danger

You may place your desktop computer on its side as long as the base is stable and level. However, it *must* be placed on its left side. (This position places the power on/off button at the highest point when placed on its side.) This ensures that the hard drive is not upside down.

Connectors are referred to as male and female. A male connector has multiple pins; a female connector has multiple holes (or sockets).

Usually, the connector style depends on how the port will be used.

The following figures show typical male and female connectors and some of the more common pin and pin holes (sockets).

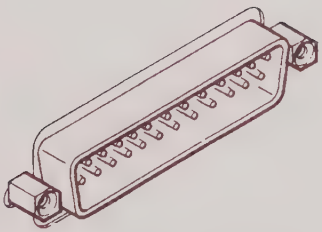


Figure 1-3-4. Typical DB25 Male Connector

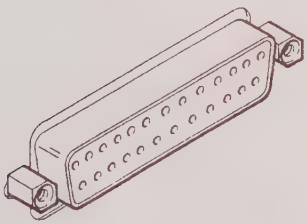


Figure 1-3-3. Typical DB25 Female Connector

> **Note:** Before connecting your peripheral devices, refer to Chapter 5, Mainboard Operations in this guide and the peripheral devices user's manual for detailed information about the correct port connection.

Figures 1-3-5 and 1-3-6 show the backpanel of a typical desktop and vertical-system port configuration. However, it is important to keep in mind that not all systems are configured the same. The location of the connectors on your system may be different.

Also, to make the task of identifying ports simpler, ZEOS ships systems with small plastic caps on each port connection. These caps label and identify each port connection (e.g. Serial, Video, Parallel).[v][v]

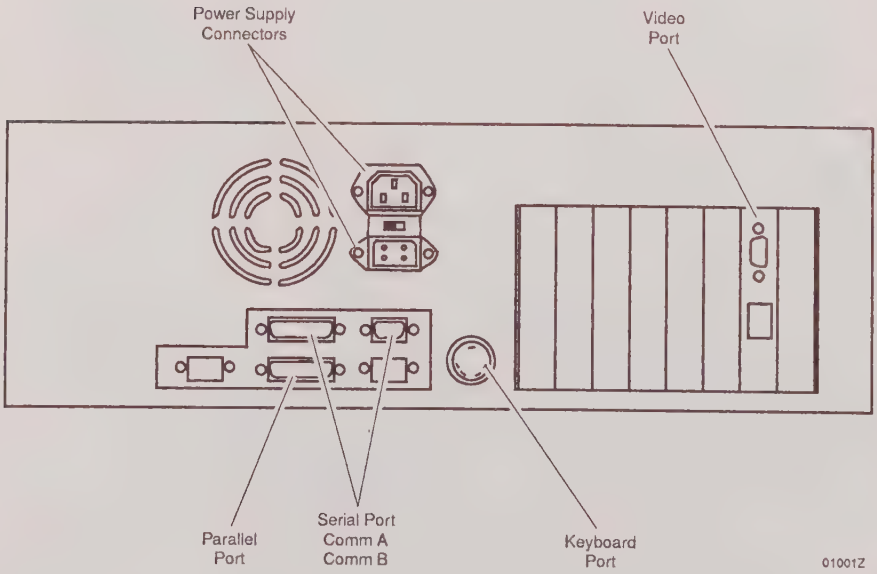


Figure 1-3-5. Typical Desktop Backpanel

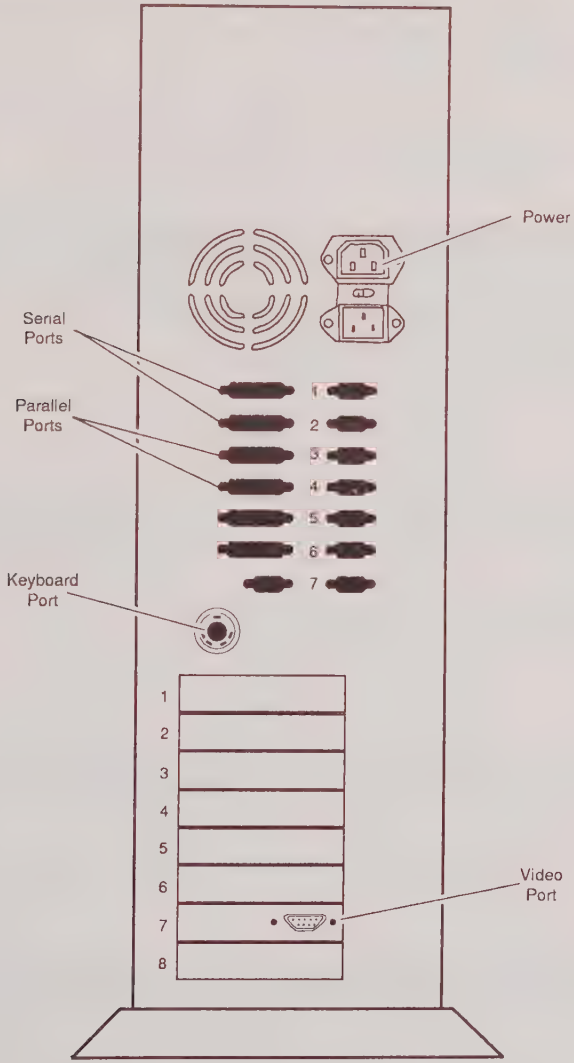


Figure 1-3-6. Typical Vertical Backpanel

Connecting Your Peripherals

To connect your peripherals, use following instructions and refer to system backpanel configuration figures as necessary.

Caution

Ensure the power switches on your system and all your peripheral devices are OFF before you begin making your connections.

1. Verify the voltage configuration switch on the back of the computer is set correctly for your electrical environment.

Warning

The setting for the Unites States and Canada is 115/120 volts; in other countries, it may be 220/230 volts, If you're uncertain, check with the utility company serving the area.

2. Remove the cardboard insert in the disk drive(s).
3. Plug the power cord into the back of the computer.
4. Plug the other end into a grounded wall outlet or surge suppressor.

Note:

Your computer has a high-quality built-in surge suppressor. However, you may further protect your system from damage that can be caused by electrical surges by plugging your system into an external surge suppressor.

Be sure to use a high-quality surge suppressor. Many inexpensive surge suppressors do not provide adequate protection.

If you have questions about what to look for when selection a surge suppressor, call your ZEOS Sales Consultant.

5. Connect the monitor video cable to the video port on the back of the computer. Tighten video connector screws.

6. Plug the monitor power cord into a wall outlet or surge suppressor.

7. If you are connecting a multisync monitor, ensure that the TTL-analog switch is set to the proper position. The analog setting is for standard VGA style, super VGA (SVGA), and other high-resolution monitors. (Refer to the manual supplied with your monitor for detailed information regarding the TTL-analog switch.)

8. Locate the end of the keyboard cable. Position the keyboard cable plug to match the notch in the round keyboard socket on the back of the computer.

9. Connect the cable on the optional mouse to the back of the computer. Usually the mouse is a serial device. It must be plugged into one of your COM (serial) ports.

Danger

When you finish connecting all your peripheral devices and position your system in its final location, be sure to allow enough room around the fan vent for air to circulate freely. Never block the vent opening. The built-in power supply uses this vent for cooling and to circulate air inside the computer.

Danger

Before restarting your system, allow the system to warm up to room temperature for at least 24 hours if it has been exposed to extremely hot or cold conditions. Extreme cold forms condensation as the system adjusts to room temperature that could cause electrical and/or component failures. If condensation forms, do not power on the system until the accumulated condensation has evaporated.

Section 4 — Starting Up Your System

This section explains:

- How to power up your system the first time
- How to start up your system (boot up)
- What "booting up" means
- What happens when your system starts up

Powering Up For The First Time

Danger

Before restarting your system, allow the system to warm up to room temperature for at least 24 hours if it has been exposed to extremely hot or cold conditions. Extreme cold forms condensation as the system adjusts to room temperature that could cause electrical and/or component failures. If condensation forms, do not power on the system until the accumulated condensation has evaporated.

Before powering up your system for the first time, you need to know:

- You may boot up from your hard drive.
- Your hard drive is completely formatted with one partition.
- C: is the logical drive.
- All the MS-DOS files are installed on your hard drive.
- If you purchased Windows with your system, your mouse software is installed.
- SETUP has been run.

- If you purchased Windows with your system, it has been installed.
- When you power up for the first time, simply follow the instructions displayed on your screen. After completing the display screens, if you purchased Windows, the Windows Program Manager appears. Refer to your Windows Getting Started User's Guide for operating instructions.

If you did not purchase Windows, the DOS prompt appears. If you are installing an operating system other than MS-DOS, please refer to your operating system software installation guide for complete instructions.

1. Power up the monitor. (refer to Chapter 6, The Monitor.)

2. Power up the computer; set the power switch to the ON position.

The following events occur:

a. The computer cooling fan starts,

b. The hard disk starts,

c. The hard disk and keyboard LED indicators flash and go out, except for the Num Lock indicator located on the upper left-hand corner of the keyboard. (refer to Chapter 4 , The Keyboard for detailed explanation of the keyboard LED indicators.)

d. The Basic Input/Output System (BIOS) type and version appear on your monitor,

Note: If the monitor is to dim, adjust the brightness and contrast controls. (refer to Chapter 6, The Monitor.)

e. The operating system loads from the hard drive into system RAM,

f. The system performs the Power-On Self Test (POST) routine (refer to Running Power-On Self Test later in this chapter).

g. If POST successfully completes, the operating system searches for a file called CONFIG.SYS. (refer to Understanding How Your System Boots Up later in this section.)

h. After executing the CONFIG.SYS files, the operating system searches the root directory for a file called AUTOEXEC.BAT. (Refer to Understanding How Your System Boots Up later in this section.)

2. Power up the remaining peripherals that are attached to your system. Refer to the appropriate peripheral manuals if necessary.

> **Note:** It is generally recommended that you turn your printer on last. Refer to your printer manual for specific information.

3. Create a boot (system) disk as described in Creating a Boot (System) Disk later in this chapter.

Understanding How Your System Boots Up

You often hear the start-up process referred to as "booting up." This expression is a computer colloquialism meaning to pull your system up by its bootstraps.

You may boot up your system from the hard drive or floppy drive A:. Your system always checks drive A: first to see if it contains a system disk. If not, it looks to your hard drive for the files it needs to boot your system.

Caution

You should always have a floppy disk that has been formatted as a system disk readily available. This is often called a boot disk. It should contain only the MS-DOS start-up files. Then, if for some reason the start-up files on your hard drive are accidentally erased or altered, you can still boot up your system. Instructions for creating a boot disk can be found later in this section or your MS-DOS manual.

When your system boots up it looks for and reads a series of files in order to start up your system. Two of these files are hidden (their names cannot be seen when you ask for a MS-DOS directory). You do not need to know anything about these files except that they exist and that they are essential to the operation of your system.

The other files that are read at start up are:

- COMMAND.COM
- CONFIG.SYS
- AUTOEXEC.BAT

The files are briefly described in the following text. Refer to Your MS-DOS User's Guide for detailed information about these files.

COMMAND.COM

The COMMAND.COM file is essential to the operation of your system. Without it your system cannot boot. It contains the programming for resident MS-DOS commands (the commands which allow you to change directories, copy, rename, delete files, etc.).

CONFIG.SYS

The CONFIG.SYS file is not essential to the operation of your system, but it may be to the operation of your software. The information in this file is unique to each system. A basic file is provided with your MS-DOS software disks. You may edit it yourself by using a word processor that reads and saves ASCII files. Also, some software applications automatically alter it during their installation process.

Caution

Some software applications alter this file automatically during the installation process. Or, if the file does not already exist, they create it for you. Always keep a backup copy of your original file in case you need to return to your previous configuration.

The default file that you receive on your MS-DOS disk is similar to the following example. Example:

```
files=10
buffers=20
```

The number of files and buffers shown indicate the number of files your applications can access at one time, and the number of files that it can hold in temporary memory.

AUTOEXEC.BAT

AUTOEXEC.BAT is a batch file (a series of MS-DOS commands). Your system reads them and executes them in the order in which they appear in the file. The AUTOEXEC.BAT file is not is not provided with your MS-DOS disks and is not essential to the operation of your system. However, your system was shipped with a basic AUTOEXEC.BAT file.

This file customizes the way your system starts up (such as loading software applications, and device drivers for your peripherals). You can alter this file to meet your needs. For example, you may add a commands to automatically load your desktop publishing application or word processor when you boot the system.

Caution

Some software applications alter this file automatically during the installation process. Or, if the file does not already exist, they create it for you. Always keep a backup copy of your original file in case you need to return to your previous configuration.

To create an AUTOEXEC.BAT file, refer to your MS-DOS User's Guide.

Running Power-On Self Test (POST)

When you turn the power on to boot up your system, it performs a series of self-tests. This process is called the Power-On Self-Test (POST).

> **Note:** If nothing happens when you turn your system on, it is most likely a power related problem. Turn your system off and verify that everything is plugged in and try turning it on again. If nothing happens this time, refer to your Before Calling Technical Support Handbook for the problem-reporting procedure to follow.

The POST process is a series of diagnostic routines. These routines are coded on the Read-Only Memory (ROM) chip which is located on your mainboard. During POST all the Random-Access Memory (RAM) is checked, adapters are initialized, peripheral devices are verified, the keyboard is readied, the bootstrap loader is invoked, and this in turn loads the operating system (usually MS-DOS).

POSTicpu;post begins by testing your CPU (Central Processing Unit, a chip on your mainboard which controls all the other chips and your systems functions). If there is a problem with your CPU, the testing cannot continue.

Then, POST tests itself to make sure testing routines are being read correctly. Next, it verifies the CMOS RAM chip, the Direct-Memory Access (DMA) controller, the keyboard controller, the first 64K of RAM, the interrupt controller, the timer chip, and the cache controller. If all of these things are in working order, you hear a single beep. This indicates that the first phase of testing is complete and that all the internal components checked so far have passed their test.

If you hear more than one beep, you may have a problem with your computer. Turn your machine off for 15 seconds or more; then, turn it back on. If you hear several

beeps again, refer to your Before Calling Technical Support Handbook for suggested actions to follow.

POST uses beeps to indicate whether or not there is a problem because at this point the video system has not been checked. Your monitor cannot display messages until the first phase of POST is complete.

The second phase of POST checks the video system. Then, it checks the CMOS RAM to make sure the configuration is correct. If everything is working up to this point, you begin seeing POST's messages on your monitor.

POST then tests the rest of your memory, the keyboard, the serial/port circuits, the hard-drive controller, and any other add-on cards in your system. If there is a problem, an error message appears. Write it down. Sometimes the messages are self-explanatory; sometimes they are cryptic. Refer to your Before Calling Technical Support Handbook for proper actions to follow for the problem-reporting procedure.

If everything tested correctly, POST begins looking for the operating system so it can start up your system. First, it checks drive A:. If it finds a disk, it loads the first sector in memory. If it does not find a disk in drive A:, it loads at the first sector of your hard drive. At this point (assuming it was able to find the necessary system files), the operating system takes over for POST and your system starts to boot up.

Section 5 — Using Your System

This section explains:

- How to boot from the hard or floppy drive
- How to create a boot (system) disk
- How to use SETUP
- How to care for your system
- How to move your system

Booting From the Hard Drive

1. Turn your monitor on.
2. Turn the power on for your computer.

   The LEDs on the front of your computer (Power, Turbo, and HDD) and the keyboard LEDs (Num Lock, Caps Lock, and Scroll Lock) flash.

   The power LED on your computer remains steadily lit. The Num Lock LED on your keyboard may also remain steadily lit.

   The monitor displays the Windows Program Manager displays (if installed).
3. If necessary, adjust the brightness and contrast on your monitor. Refer to Chapter 6, The Monitor for more information about these controls.

Creating a Boot (System) Disk

1. Boot up your system from the hard drive.
2. To create a boot (system) disk {where (d:) is the drive assignment}:

   Insert a blank floppy disk in drive (d:).
3. For 5-1/4", 360 floppy disks, type:

   `format (d:) /4/s` **Enter**

   or

   For 3-1/2", 720 floppy disks, type:

   `format (d:) /f:720/s` **Enter**

   or

   For 5-1/4", 1.2 and 3-1/2", 1.44) floppy disks, type:

   `format (d:) /s` **Enter**
4. Label the disk and place it in a safe, convenient location in case it is needed to boot your system due to a failure.

Booting From Drive A:

1. Insert a MS-DOS system (bootable) disk in drive A:.

2. Turn your monitor on.

3. Turn the power on for the computer. Or, if your system is already on, press the RESET button.

   The LEDs on the front of your computer (Power, Turbo, and HDD) and the keyboard LEDs (Num Lock, Caps Lock, and Scroll Lock) flash.

   The power LED on your computer remains steadily lit. The Num Lock LED on your keyboard may also remain steadily lit.

   The MS-DOS command prompt A: appears on the monitor.

> **Note:** Some systems also display the time and date and time.

4. If necessary, adjust the brightness and contrast on your monitor. Refer to Chapter 6, The Monitor for more information about these controls.

> **Note:** It is generally recommended that you turn your printer on last. However, you should refer your printer manual for specific information.

5. Power up the remaining peripherals that are attached to your system. Refer to your peripheral manuals if necessary.

6. To create a boot (system) disk, use the DISKCOPY command to make a working copy of your original MS-DOS disks. Store the originals in a safe place and use the DISKCOPY version as your working boot disk. Refer to your MS-DOS User's Guide for additional information.

Using SETUP

It's best to make a note of the SETUP screen when you first receive your system so you will know how to reset your system if it becomes necessary. There are three situations that require running the SETUP Program:

- If your batteries die or become dislodged
- Electrical surges
- If you change your system configuration.

The following table is provided for you to make notes of how your system is configured and any changes you've made to the configuration through the life of the machine. The table contains some of the most common parameters in the SETUP program. Your SETUP may have other parameters not listed here. Refer to Chapter 5, Mainboard Operations for detailed instructions for using the SETUP Utility.

SETUP Configuration

	Default	Change # 1	Change # 1
System Time			
System Date			
Diskette A			
Diskette B			
Hard Disk 1			
Hard Disk 2			
Base Memory			
Extended Memory			

SETUP Configuration			
	Default	Change # 1	Change # 1
Video Card			
Keyboard			
CPU Speed			
NumLock on at boot			
Shadow BIOS ROM			
Shadow Video ROM			
Shadow 16K C4000h			
Shadow 16K C8000h			
Shadow 16K CC000h			
Shadow 16K D4000h			
Shadow 16K D8000h			
Shadow 16K DC000h			
CPU Speed			
DRAM Speed			
VL Bus Master			
SCSI			
Interrupt Channel			
Disconnect			
Synchronous			
Parity			
Messages			

Configuration Notes

Modifying SETUP

Refer to Chapter 5, Mainboard Operations for instructions about how to access SETUP and make changes.

Changing the Turbo Setting

The TURBO LED on the front of your computer is lit when you are in turbo mode. When lit, your system is operating at its fastest speed. To maintain software compatibility with games and some software developed prior to 1987, the microprocessor in your system can be slowed down to operate at a slower speed.

If the CPU Speed option provided in the system SETUP program is set to Fast, your system operates at the fastest speed when powered on. If the CPU Speed option is set to Slow, you can toggle between fast and slow using the TURBO switch on the front panel.

> **Note:** Some protected mode programs do not work properly at the slow speed. Never operate your system at the slow speed unless it is necessary to do so.

Refer to the Chapter 5, Mainboard Operations in this guide for detailed information on the CPU Speed option.

Locking Your Keyboard

A key is included with your system. It fits into the lock on the front of your computer. If you turn the key to the left, it is in the unlock position. Turn it to the right and it is in the lock position.

Locking the keylock disables the keyboard.

Restarting Your System

The Reset feature allows you to restart your system without actually turning power off and on.

You should use it:

- If for some reason your system"locks up". (Your system is "locked up" if keyboard entries do not appear on the monitor or affect the operation of your system.)
- If you have changed something in your system's configuration.
- If the application you are using recommends it.

To restart your computer:

1 If possible, exit your application and return to the MS-DOS prompt.

2 If you have a non-system disk in drive A:, remove it.

3 If you want to boot up from drive A:, insert the system disk in the drive.

4 Press the RESET button.

> **Note:** You may also restart your system by pressing the Ctrl, Alt, Delete keys simultaneously. This called a "soft" boot. Keyboard soft booting doesn't always work. If it doesn't reboot the system, then press the RESET button.

Caring for Your System

The four greatest enemies to your system are excessive heat, dirt(dust), moisture, and jolts of electricity. To ensure a long life for your system, try to eliminate these things as much as is reasonable from your computer's environment.

- To make sure your computer runs coolly and efficiently, keep it out of direct sunlight and be sure to allow enough room around the fan for air to circulate freely. The effects of excessive heat are relatively immediate. Your system simply stops running if it gets too hot.
- A dirty environment also makes a dirty computer. Dust and other environmental contaminants can filter their way inside your computer. This can cause the moving parts in your computer to move less freely and efficiently. You should keep your work area as clean as possible.
- Moisture can be absolutely deadly to your system. Your system is made up of electrical components. Moisture of any kind can cause short circuiting to occur. Do not bring coffee, soda pop, water, or other liquids near your system.
- You should also be wary of spray cleaners. When you clean the exterior of your system, moisten a cloth instead of spraying any of your components directly.
- Jolts of electricity can also cause damage. The components inside your computer are very delicate and especially vulnerable to quick fluctuations in electrical current. Installing a surge suppressor helps provide protection while your system is in use.

You should also make sure your system is turned OFF before you connect or disconnect anything to it. And, if you just turned your system off and want to turn it back on, wait at least 15 seconds so the power supply can reset itself.

Moving Your System

If it becomes necessary to move your system, you should read and follow the these instructions.

Warning

Before you begin disconnecting and moving your system components, be sure power is turned OFF on every unit.

1. Unplug the power cord from the wall outlet or surge suppressor and the computer.
2. Unplug the monitor from the wall outlet or surge suppressor, if necessary.
3. Disconnect the peripheral cables from the backpanel.
4. Check the screws that hold your computer cover in place to make sure they are secure.
5. Put the cardboard shipping inserts in the disk drive(s).

   Note: If you did not save these, use a blank disk instead.
6. If you are shipping your system or moving it a long distance, place each unit in its original packing container.

7. Carefully move everything to its new location. Avoid sudden bumps or shocks.

Danger

Before restarting your system, allow the system to warm up to room temperature for at least 24 hours if it has been exposed to extremely hot or cold conditions. Extreme cold forms condensation as the system adjusts to room temperature that could cause electrical and/or component failures. If condensation forms, do not power on the system until the accumulated condensation has evaporated.

Chapter 2 — The Hard Drive

This chapter contains information about:

- The various types of disks and disk drives
- How to backup the hard drive
- How to prepare the drive for use

Disks and Drives

Most computers have at least one hard drive and one or two floppy disk drives.

The floppy disk drives are known to your system as drives A: and B:. Typically, the hard drive is C:. If you have only one floppy drive, it is known as A:.

When you boot up your system, it automatically reads and writes from the drive you used to boot up. So, if you booted up from the hard drive, your default drive will be drive C:. If you want to read and/or write to a file on a drive other than your default, you must indicate the drive where the file is located or will be located.

In general, both types of disks; floppy (removable) disks and hard disks perform the same function of storing data and program applications.

The various types of drives are also basically the same. They have read and write heads that allow you to record information so that it may be read and used at a later time. Disks have a magnetic surface that is divided into concentric circles called tracks. Each track is divided into sectors. When you format a diskette, MS-DOS places markers for each track and sector and creates an index called the File Allocation Table (FAT). This table keeps track of the specific location of each track and sector.

When you save a file, MS-DOS checks the FAT table to find out if and where there is space. Then it moves the read/write heads to that location, records the data and updates the File Allocation Table. When you want to retrieve the data, MS-DOS refers to the table again to locate your file. It moves the read/write heads to the correct location and retrieves the data.

Hard Disk Types

Hard drives can store more data than a floppy disk as well as retrieve data much faster.

The type of hard drives currently available from ZEOS include:

- Integral Device Equipment (IDE),
- Enhanced Small Device Interface (ESDI), and
- Small Computer Systems Interface (SCSI).

The IDE drive combines the controller and hard drive in a single unit. The controller is built on to the drive. It connects to the system's mainboard through built-in connectors on the mainboard.

The ESDI drive incorporates some controller functions into the drive but requires a separate ESDI controller expansion card. While this drive offers a higher performance, the required ESDI controller is limited to only ESDI drives. This type drive is generally used on networks or for users with applications that are extremely disk intensive.

The SCSI drive requires a SCSI controller and is also generally used in a network environment. This drive offers superior performance characteristics and storage capacities. It connects to the system's mainboard through built-in connector on the mainboard. The SCSI controller allows you to connect and control up to seven different devices, such as printers, CD-ROM drives, tape backups and optical disks.

Making Backups

A backup is simply a duplicate copy of a disk, file, or group of files.

Danger

Accidents happen! Therefore, it is *extremely* important to make backups of all your disks (floppies and hard disk). Then, if your data is lost, you are prepared.

Instead of having to redo everything that is lost, you need only go to the most recent backup.

How often you back up will depend on how often your data changes and how important your files are. For example, files that change every day and are critical to what you are doing should be backed up every day.

There are several methods for making backups. Two of those methods are the MS-DOS COPY command and the MS-DOS BACKUP/RESTORE commands.

If you use the COPY command, files are copied in the same format in which they were created. So, you may read and write to the copy just as you would to the original. The disadvantage in copying files is that if your original (hard) disk has more files or data than will fit on your destination disk, MS-DOS will simply stop copying when it runs out of room.

The BACKUP command organizes your files more efficiently than COPY and uses less disk space. Also, if the data on your original disk can not fit on a single destination disk, MS-DOS prompts you to insert another disk and it automatically continues copying (backing up) where it left off.

To use files saved with the BACKUP command, you must restore them using the RESTORE command. Be sure to use the same version of MS-DOS (4.01, 5.0, etc.) to backup.

Refer to your MS-DOS User's Guide for additional information about the COPY, BACKUP, and, RESTORE commands.

Another faster and more efficient method of backing up data is to use a tape backup device. If you have questions, your ZEOS System Consultant can provide information and assist you in ordering a backup unit.

Preparing Your Hard Disk

Before you proceed, you will need to know the answers to the questions that follow.

- Did you purchase MS-DOS
- If so, what version did you purchase?

If you purchased MS-DOS version 3.3 with your system:

1. You may boot up from the hard drive and begin using your system.
2. Your hard disk has been completely formatted in two or more partitions depending on the size of your hard drive.
3. The partitions are assigned logical drives C:, D:, etc.
4. Drive C: is the primary drive and contains all the DOS files. Drive D: and subsequent drives are the extended drives.

When you boot up, the MS-DOS prompt `C:>` appears.

If you purchased MS-DOS version 4.0 or higher with your system:

1. You may boot up from your hard drive.
2. Your hard drive is completely formatted with one partition.
3. C: is the logical drive.
4. All the MS-DOS files have been copied to your hard drive.

When you boot up, the MS-DOS shell appears.

> **Note:** If Windows is installed, the Windows Program Manager appears.

If you did not purchase MS-DOS with your system :

1. A low-level format has been performed on your system's hard drive.

Before you install MS-DOS on the primary drive, you'll need to partition the drive and perform a high level format.

Partitioning The Hard Drive

Partitioning allows you to create different sections on your hard disk. MS-DOS recognizes each of these sections as a separate hard disk and identifies them as drives C:, D:, E:, F:, etc.

Partitioning allows you to divide your hard disk so you can use more than one operating system on the same computer. For example, if most of your software programs are MS–DOS based, but you also have an application that requires a Xenix operating system, there are a variety of alternatives. Probably the simplest and least expensive is to create two partitions on your hard drive, install MS-DOS on one and Xenix on the other.

Another reason for partitioning is, if the version of MS-DOS you are using recognizes only 32 Megabytes and the capacity of your hard drive is more than 32 Megabytes. This is true if you are using MS-DOS version 3.3.

The FDISK program of MS-DOS allows you to create, change and delete partitions. This program requires that you designate which partition you want to be active; in

other words, the partition that contains the files for booting up your system. Typically, the active partition is the C: drive. The other partitions are considered extended partitions and do not need the startup files.

You must also indicate how much disk space you wish to allocate to each partition. This is done by entering the percentage of your hard disk that you want to use for each partition.

For detailed information about using FDISK for creating, checking or changing partitions, refer to your MS-DOS User's Guide.

Chapter 3 — The Floppy Drive

This chapter contains information about:

- The various types of disks and disk drives
- How to format a floppy disk
- Making backups
- Copy protecting your disks
- What to do to install a floppy drive
- How to clean your floppy drive
- How to clean and handle your floppy disks
- What to do when you have floppy drive/disk problems

Disks and Drives

In general, there are two types of disks; floppy (removable) disks and hard disks. They perform the same function of storing data and program applications.

The various types of drives are also basically the same. They have read and write heads that allow you to record information so that it may be read and used at a later time. Disks have a magnetic surface that is divided into concentric circles called tracks. Each track is divided into sectors. When you format a floppy disk, MS-DOS places markers for each track and sector and creates an index called the File Allocation Table (FAT). This table keeps track of the specific location of each track and sector.

When you save a file, MS-DOS checks the FAT table to find if and where there is space. Then it moves the read/write heads to that location, records the data and updates the File Allocation Table. When you want to retrieve the data, MS-DOS refers to the table again to locate your file. It moves the read/write heads to the correct location and retrieves the data.

Identifying Drives

Most computers have a hard drive and one or two floppy disk drives. The floppy disk drives are known to your system as drives A: and B:. Typically, the hard drive is C:. If you have only one floppy drive, it is known as A:.

When you boot up your system, it automatically reads and writes from the drive you used to boot up. So, if you booted up from the hard drive, your default drive will be drive C:.

If you want to read and/or write to a file on a drive other than your default, you must indicate the drive where the file is located or will be located.

If drive C: was the current drive and you wanted to change to a different drive:

1. At the C: prompt, type: `(d:)`

   {where (d:) is the drive you want to change to}

2. Press: **Enter**

3. The DOS prompt changes to: `(d:)`

For additional information on changing to a different drive, directory, and/or files, refer to Chapter 1, System Overview or your MS-DOS User's Guide.

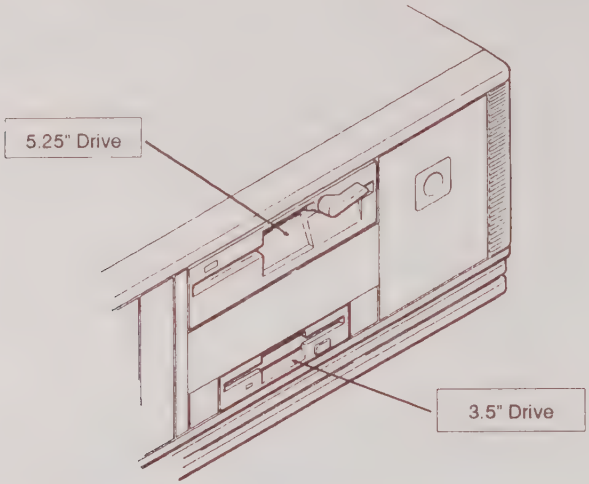


Figure 3-1. Floppy Drive Types

Floppy Disk Types

Floppy disks come in two different sizes. Each have two different disk space capacities.

The 5-1/4" disk may be:

- 360K DS/DD capacity
- 1.2MB DS/HD capacity

> **Note:** Many 360K capacity disks have a Hub-ring reinforcement (thin plastic rings like those used to reinforce three-ring notebook paper) intended to help the disk withstand the mechanical forces of the clamping mechanism on the inner side of the large round hole in the center. The 1.2MB disks usually lack these reinforcements because the difficulty in accurately placing them on the disk means that they will cause alignment problems.

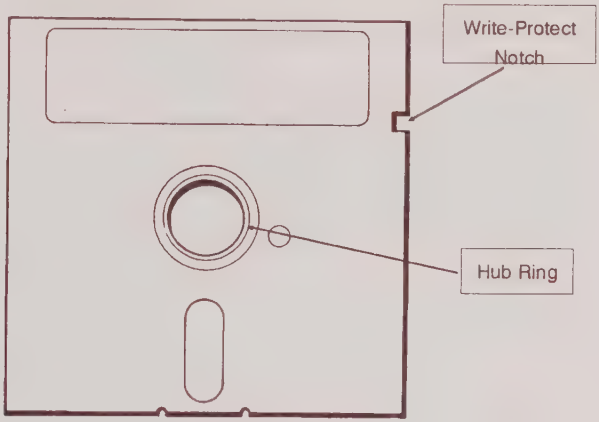


Figure 3-2. 5.25 " Data Disk

In order to read or write to a disk, it must be used in a drive that is designed for the specific type of disk you are using. Obviously, a 3-1/2" disk can only be used in a drive of the same size. The same is true for a 5-1/4" disk. But, you must also pay attention to the byte capacity of your disk and disk drive. For example, a 5-1/4" drive that is designed to read and write to a 360K DS/DD disk will not be able to read or write to a disk that is an 1.2MB DS/HD.

The 3-1/2" disk may be:

- 720K DS/DD capacity
- 1.44MB DS/HD capacity

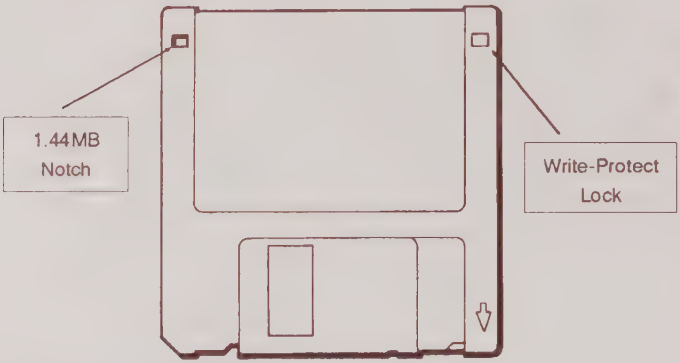


Figure 3-3. 3.5" Data Disk

Generally, the disk types will be identified on the label applied by the disk manufacturer. To find out what type of drive(s) you have, refer to your packing slip. If it's not available, remove the cover of your system; locate the drive; and look for a model number. Unless ordered otherwise, your system includes a 5-1/4", 1.2MB DS/HD and/or a 3-1/2", 1.44MB DS/HD floppy drive.

Formatting Floppy Disks

Before you can read and write to a disk, it must be formatted. The formatting process prepares your disk to accept and file data. Formatting a floppy disk is a three step process. Refer to your MS-DOS manual for specific instructions. The instructions that follow explain how to format a floppy disk for storing data.

To format a 360K disk in a 1.2MB floppy drive using MS-DOS version 5.0 commands:

1. If your system is not already booted up, do so now.
2. Insert a 360K disk in drive A: and close the door.
3. Type `format A:/4` and press **Enter**.

   The DOS prompt displays:

   ```
   Insert new diskette for drive A:
   and press Enter when ready...
   ```

   The drive indicator lights and there is a grinding noise made while the drive is formatting.

The DOS prompt displays:

```
Checking existing disk format.
Formatting 360K
xx percent completed.
```

where xx increases in percentage as the formatting process progress.

When the xx percent completed prompt is replaced by the `Format complete` prompt, the monitor displays:

```
Volume label (11 character, Enter for none)?
```

Refer to your MS-DOS User's Guide for information on Volume Labels. Otherwise, press **Enter**.

```
The DOS prompt then displays:
362496 bytes total disk space
362496 bytes available on disk
 1024 bytes in each allocation unit.
 354 allocation units available on disk.

Volume Serial Number is xxxx-xxxx
```

Note: Where xxxx-xxxx is a number assigned by DOS. The number does not change unless the disk is formatted again.

```
Format another (Y/N)?
```

You then indicate by typing `Y` or `N` whether to format additional data disks.

To format a 1.2MB data disk in a 5-1/4", 1.2MB floppy drive or a 1.44MB data disk in a 3-1/2", 1.44MB floppy drive {where (d:) indicates the drive assignment}.

For step 3 of the preceding procedure, type:

`format (d:)` and press: **Enter**

To format a 720K data disk in a 3-1/2", 1.44MB drive {where (d:) indicates the drive assignment}.

For step 3 of the previous procedure, type:

`format (d:)/f:720` and press: **Enter**

Refer to your MS-DOS User's Guide for additional information about formatting data disks.

Making Backups

A backup is simply a duplicate copy of a disk, file, or group of files.

Danger

Accidents will happen! Always make backups of all your disks (floppies and hard disk). Then, if your data is lost, you are prepared. Instead of having to redo everything that is lost, you need only go to the most recent backup.

How often you back up will depend on how often your data changes and how important your files are. For example, files that change every day and are critical to what you are doing should be backed up every day.

There are several methods for making backups. Two of those methods are the MS-DOS COPY command and the MS-DOS BACKUP/RESTORE commands.

If you use the COPY command, files are copied in the same format in which they were created. So, you may read and write to the copy just as you would to the original. The disadvantage in copying files is that if your original disk has more files or data than will fit on your destination disk, MS-DOS will simply stop copying when it runs out of room.

The BACKUP command organizes your files more efficiently than COPY and uses less disk space. Also, if the data on your original disk cannot fit on a single destination disk, MS-DOS prompts you to insert another disk and it automatically continues copying (backing up) where it left off.

To use files saved with the BACKUP command, you must restore them using the RESTORE command. Be sure to use the same version of MS-DOS (3.3, 4.01, etc.) to backup.

Another faster and more efficient method of backing up data is to use a tape backup device. If you have questions, your ZEOS System Consultant can provide information and assist you in ordering a backup unit.

Write Protecting

You can protect the data on your disks from being changed or erased. If you are using 5-1/4" disks, there are tabs included in each box of disks that allow you to write protect the disks. Refer to Figure 3-2.

If you are using a 3-1/2" disks, there is a lock on the back. Move the tab into the lock position to prevent the disk from being written to. Refer to Figure 3-3.

Unpacking Floppy Drive

The floppy disk drive is designed to withstand normal handling when unpacking and installing. Refer to the following guidelines when handling the disk drive.

- Be careful when handling the disk drive. Do not drop, discharge static electricity, or cause shock to the drive components. Doing so can permanently damage the drive and void the warranty.
- Handle the drive by the ends to avoid touching the circuit board components.
- Do not lift the drive by the faceplate or the circuit board.
- Once the drive is unpacked, only place the drive on antistatic surfaces, such as the antistatic drive bag. We recommend that you do not unpack the drive until you are ready to install it.

Before Installing the Drive

Remove the computer cover according to the instructions found in Chapter 7, Expanding Your System.

Danger

- The system's power supply contain AC voltage at levels that can cause injury or death on contact. Before removing the cover, turn off the system and unplug the system's power cord from the wall outlet or surge suppressor.
- Electro-Static Discharge. Many of the computer system's internal components are extremely sensitive to static electricity. Discharge your body's static-electricity charge by touching a grounded surface (such as, the computer chassis if power connector is connected to a three-prong wall outlet or surge suppressor).

Ensure you have the following items before installing your new drive.

- A Phillips-head screwdriver
- A 34-pin host interface cable, not more than 18 inches long—34-pin, keyed edge connector.

There are some other items your system may require:

- You may need to use a power Y-adapter if you are installing the drive as a second floppy drive and you do not have two internal power connectors. This adapter can be purchased through your ZEOS System Consultant.
- If you are installing a 3-1/2" drive in a 5-1/4" drive bay, you need a 5-1/4" frame. This can be purchased through your ZEOS System Consultant.

Installation

This section provides the steps necessary to prepare and install the floppy drive in your computer.

Step 1: Determining Your Installation Configuration

Step 2: Installing the Drive

Step 1: Determining Your Installation Configuration

Once you have all the items necessary, you are ready to install the drive in your system.

You may use the floppy drive as a new drive in the computer, or as a replacement for an existing drive. There are two main installation configurations:

- The drive is cabled directly to a 34-pin connector on the mainboard.
- If you are using the drive as one of two floppy drives in the computer (dual installation), you may use either configuration. In dual installations, you must use a 34-pin, host-interface, twisted-pair cable with three connectors, and daisy-chain the two drives to the mainboard .

Dual Installations

Dual installations require a drive 0/drive 1 (A:/B:) configuration, where one drive is designated as drive 0 (A:) and the other is drive 1 (B:). The floppy drive is compatible in dual installations with other floppy drives that support a drive 0/drive 1 configuration.

Be sure to determine your installation requirement, configuration, and materials before proceeding.

Step 2: Installing the Drive

Warning

You may damage the drive if the interface cable is not connected properly. To prevent incorrect connection, use a cable that has keyed connectors.

If you are replacing an existing floppy drive, you need to remove the existing drive.

You are now ready to install the floppy drive. Make sure your interface cable is no longer than 18 inches. Also, if you are connecting two drives together, you need a daisy-chain, twisted-pair cable that has three, 34-pin connectors. You can order this from your ZEOS System Consultant.

Connect the Interface Cable to the Drive

1. Connect the 34-pin connector to the 34-pin keyed, edge connector on the floppy drive. For dual installations, daisy-chain the two drives together by connecting them with a three-connector interface cable (ensure correct orientation: red stripe should be toward power connection).

2. Route the cable toward the mainboard area. The cable should easily route from the floppy drive to the mainboard. The cable should not block any airflow paths.

3. Insert the floppy drive halfway into the floppy drive bay.

Connect the Power Supply Cable

1. Attach the power supply cable to the power connector on the floppy drive.

2. Completely insert the drive into your floppy drive bay.

Insert Mounting Screws

1. Mount the floppy drive and frame to the drive bay using four 6-32 screws (3/16"). Use the correct size screws. Screws that are too long will damage the drive.

Connect the Interface Cable to the Host

1. Connect the interface cable the 34-pin FDD connector.

2. Replace the computer case.

Run SETUP Utility

You need to add your new floppy drive in SETUP in order for the system to acknowledge its presence.

Refer to Chapter 5, Mainboard Operations for instructions on accessing SETUP and changing/adding parameters.

Cleaning Your Floppy Disk Drive

If you notice that the DOS Abort, Retry, Ignore prompt displays more than normal, you should clean your floppy drive to solve the problem.

The following table outlines a recommended head-cleaning schedule.

System Usage	Cleaning Interval
Over 6 hours each day	Weekly
Daily	Monthly
Light to moderate	Twice monthly
Occasionally	Every 6 months

Caring for Your Floppy Disks

Disks can be damaged or destroyed easily by:

- Touching the recording surface with your fingers or anything else
- Writing on a disk label with a ball-point pen or pencil
- Bending the disk
- Spilling liquids or other substances on the disk
- Overheating a disk (leaving it in the hot sun or near a radiator)
- Exposing a disk to stray magnetic fields.

Chapter 4 — The Keyboard

This chapter contains:

- Illustration of the keyboard.
- Information about how to install, lock and care for your keyboard.
- Descriptions of special keys, cursor movement keys, function keys, arrow keys in the numeric keypad.

Installing Your Keyboard

1. Turn the keyboard keylock on the computer control panel to the unlocked position.

2. Ensure the 8088-80286/80386/80846 switch located on the bottom of the keyboard is in 80286/80386/80486 position.

3. Plug the round keyboard connector into the computer backpanel in the keyboard port. Turn on your system and test the keyboard.

Note: If your system was on while installing the keyboard, press the RESET button on the computer control panel.

Using Your Keyboard

Your keyboard allows you to communicate with your system by entering data and commands. Each time a key is pressed or released, the keyboard sends a code to your system. This keyboard code is decoded by firmware within your system mainboard.

ZEOS offers different styles of keyboards. Figures 4-1 and 4-2 show two of our most popular. After the illustrations you will find general descriptions of the special keys, cursor movement keys, function keys, and the keys in the numeric keypad.

The keyboard shown in Figure 4-1 is called an RS keyboard because it is more compact than standard keyboard models.

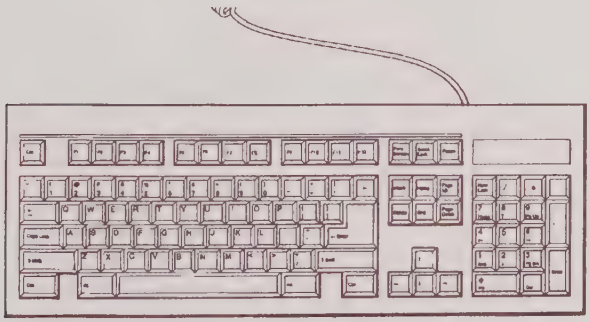


Figure 4-1. RS Keyboard

The keyboard shown in Figure 4-2 is called an F12 keyboard. The F12 keyboard its function keys located on the left side instead of across the top.

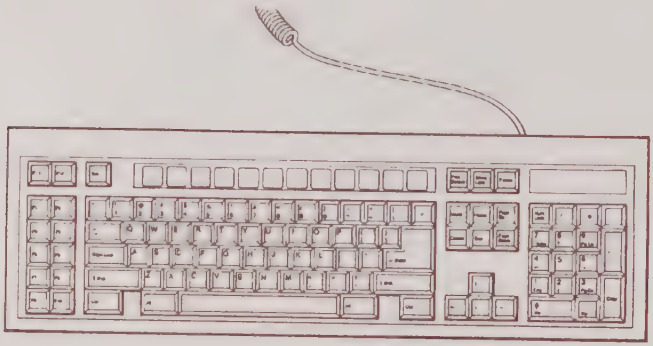


Figure 4-2. F12 Keyboard

> **Note:** Many keyboards have a switch on the bottom side. They are often labeled 8088 and 80286/80386/80486. Ensure that the switch is in the 80286/80386/80486 position. Keyboards from other manufacturers may have jumpers rather than a switch. Consult your keyboard manual for additional details.

Table 4-1 describes the purpose and function of each key. The purpose and function of any key depends on how it is defined in the software application you are using. The software application user's guide describes the function of each key or combination of keys.

Table 4-1. Keyboard Keys

Typewriter Keys	
The typewriter keys are located and operate similarly to a regular typewriter.	
Special Keys	
Alternate (Alt)	The **Alt** key is used with other keys to perform special functions defined by the application you are using. When instructed to use the **Alt** key, you should press and hold it and then press the other key(s) specified.
Caps Lock	The **Caps Lock** key toggles on and off making the typewriter letter keys appear in uppercase.
Control (Ctrl)	The **Ctrl** key is also used with other keys to perform special functions defined by the application you are using. When instructed to use the **Ctrl** key, you should press and hold it and then press the other key(s) specified.
Delete (Del)	The **Delete** key deletes the character on which the cursor is positioned.
Enter	(Note: Some software user's guides call this key the Return key.) The **Enter** key completes a command to the computer.
Escape (Esc)	The **Esc** key generally allows you to escape a function without completing it.
Insert (Ins)	Use the **Insert** key to toggle in and out of insert mode. When you are in insert mode, inserted characters move the existing characters to the right of the cursor one position for each inserted character. When you are in typeover mode, the characters you enter take the place of the existing characters.
Pause	The **Pause** key temporarily stops output from the application that you are using.
Print Screen	Typically, the **Print Screen** key sends the characters that appear on the screen to the printer for output.
Scroll Lock	The **Scroll Lock** key is defined by the application software you are using. MS-DOS does not define a function for this key.
Shift	The **Shift** keys shift the typewriter keys from lower to uppercase, numeric keys from numbers to symbols and the numeric keypad from numbers to cursor movement (when the **Num Lock** key is on). In the numeric keypad, the **Shift** keys reverse **Num Lock** and **Caps Lock** if they are turned on.

Table 4-1. Keyboard Keys

Cursor Movement Keys	
Backspace (Bksp)	The **Backspace** key is typically located above the **Enter** key. It may be labeled as **Bksp** or as an arrow pointing to the left. The **Backspace** key moves the cursor to the left one space erasing the characters in its path.
Down Arrow (↓)	The Down Arrow (↓) moves the cursor down one line each time you press it. If you hold it down this action will repeat until you release it.
End	Typically, the **End** key moves the cursor to the last character of the word or line.
Home	The **Home** key can be defined by the software application you using. Typically, the **Home** key moves you to the top of the page on which you are working.
Left Arrow (←)	The Left Arrow (←) moves the cursor to the left one character each time you press it. If you hold it down this action will repeat until you release it.
Page Down (PgDn)	The **Page Down** key moves the cursor to the next page.
Page Up (PgUp)	The **Page Up** key moves the cursor to the top of the previous page.
Right Arrow (→)	The Right Arrow (→) moves the cursor to the right one character each time you press it. If you hold it down this action will repeat until you release it.
Tab	The **Tab** key moves the cursor to the next tab setting or field. Typically, **Shift**+**Tab** moves the cursor back a tab setting or field.
Up Arrow (↑)	The Up Arrow (↑) moves the cursor up one line each time you press it. If you hold it down this action will repeat until you release it.
Numeric Keypad	
The keys in this keypad have dual functionality. In numeric mode (when the Num Lock light is on), they work like a ten-key calculator. Out of numeric mode, they operate according to the software application that you are using. However, most software applications define these keys similarly. *See also Cursor Movement Keys and Special Keys for descriptions of the appropriate keycap legend.*	
Num Lock	The **Num Lock** key toggles the numeric keypad in and out of numeric mode.
Function Keys	
The purpose of the function keys (**F1** through **F12**) depends on the application you are using.	

Locking Your Keyboard

A key is included with your system. It fits into the lock on the front of your computer. If you turn the key to the left, it is in the unlock position. Turn it to the right and it is in the lock position.

Locking the keylock disables the keyboard and prevents the system from successfully completing POST. Locking the keylock after bootup disables the keyboard, but does not disable the mouse (if installed).

Caring for Your Keyboard

Your keyboard requires very little care except to keep it as clean as possible. You should clean it frequently and not wait for it to look dirty.

The following guidelines should be used for cleaning and caring for your keyboard.

- Do not eat or drink over your keyboard. Many little spills and falling crumbs eventually add up to a sticky mess.
- Vacuum your keyboard regularly with a household vacuum using a brush attachment. Invest in a can of compressed air. Preferably, look for the kind that has a long nozzle so you can spray between the rows of keys.

Chapter 5 — Mainboard Operations

This chapter contains:

> **Note:** *Insert* your *Mainboard Operations Manual* (supplied with your system) after this chapter cover page.

Your Mainboard Operations Manual contains:

- Mainboard specifications and features
- Connections and jumper configurations
- Detailed information about using the system SETUP utility
- Instructions how to install mainboard options

Chapter 6 — The Monitor

This chapter contains:

- General information about monitors
- Descriptions of monitor types
- Description of the operating and adjustment controls
- Instructions on how to connect your monitor

Overview

Monitors are used to display text and graphics. They display your keyboard input and your computer's output.

Monitors are similar to a television monitor in the way they display text and graphics. The monitor cable transports signals from the mainboard that are then translated into tiny dots called pixels. The greater the number of pixels the better the quality of your image or the better the resolution of the monitor.

Color monitors use three electron guns that simultaneously direct beams of red, blue, and green light. The guns create an image on your screen one line at a time. When the last line is finished, they move back to the top of the screen and begin again.

The speed by which the screen image is created (painted) varies from one monitor to the next. But, in order for a screen to be recreated (repainted) without you noticing, it has to happen at least 60 times per second. This is known as vertical frequency. The horizontal frequency is the amount of time it takes for the guns to create a single line from left to right.

Some monitors are able to change the frequency by which they paint the screen. Generally, vertical and horizontal frequencies are determined by the type of video controller to which the monitor is connected. However, some monitors are able to vary their frequencies depending on the software application being used.

Other things that affect the quality of the image on your monitor are dot pitch and convergence. Dot pitch refers to the center-to-center spacing of the pixels. The tighter the dot pitch - the clearer the picture.

Convergence refers to how closely the electron guns are able to point to a single dot. Color monitors use three guns (red, blue, and green) and are not able to point precisely to the same point. Instead, they form a tiny triangle. The closer the points in the triangle — the better the convergence and the clearer the image.

Monochrome monitors do not have this problem. The image, generally white or amber, is created by a single electron gun.

Caution

- Avoid the direct sun-rays or other lightening apparatus into the CRT (cathode-ray tube). If unable, cover the monitor with a hood or other device.
- Allow adequate ventilation around the monitor so that heat can properly dissipate. Do not put anything on top of the monitor.
- Do not place any heavy objects on the power cord. Damage to the cord may cause shock or fire.
- Keep the monitor away from high-capacity transformers, speakers, radios, laser printers, electric motors, and other devices which create strong magnetic fields.

Important

- If possible, use a white background and black text to ease eye strain. Avoid installing the monitor with a bright background as such installation makes your eyes weary.
- Set the monitor just below eye level (10-15 degrees) for the ideal viewing angle.
- Match the monitor's brightness to the ambient room brightness.
- For optimum focus, the contrast control should not be turned up to its maximum position. Also, the brightness control should be adjusted to a point where the overall background area just begins to disappear.

Monitor Types

ZEOS offers several different sizes, types and models monitors. Two of the more popular types are described in the following paragraphs. Keep in mind as you review this information that the resolution and number of colors available are determined by the video controller to which the monitor is connected. Also, in order for your monitor to work properly the appropriate driver software must be installed. Driver software is supplied along with the video controller.

Video Graphic Array (VGA)

This type of monitor offers:

Resolution: 640 x 480 pixels

Colors: infinite

Super Video Graphic Array (Super VGA)

This type of monitor offers:

Resolution: 800 x 600 pixels and 1024 x 768 pixels

Colors: infinite

Other Monitors

There are many other types of high resolution monitors and advancements in video output are being made every day. Please contact your ZEOS Sales Consultant if you have any questions about upgrading your video system.

Connecting Your Monitor

To connect the monitor:

1. Turn off the power to the monitor and computer.
2. Connect the monitor's video cable to the video port. Refer to Chapter 1, System Overview for the back-panel connector locations.
3. Connect one end of the power cable to the monitor and the other end to the wall outlet or surge suppressor.
4. Turn power on to system. The display lights.
5. Adjust contrast and brightness controls to obtain optimum picture quality. If nothing displays on the monitor, refer to your monitor user's guide included in the monitor packaging box.

Chapter 7 — Expanding Your System

This chapter contains brief descriptions of:

- What's inside your computer unit
- Add-on boards
- Bus connectors
- Expansion slots

In addition, this chapter describes how to:

- Remove the computer unit cover
- Install add-on boards
- Install additional memory
- Replace the internal on-board battery

Overview

Your ZEOS computer is designed to be worked on and expanded by you, the user. It is extremely adaptable. The original configuration can be expanded/changed in a variety of ways to satisfy your individual needs. With the wide range options available, this chapter only provides general system expansion instructions. We recommend you refer to the detail instructions provided in each individual option's user's guide. .

Generally, if you change or add devices, such as:

- microprocessor,
- floppy/hard drive(s),
- additional memory, or
- a different type of video adapter than what you are currently using.

You may also have to run the system SETUP Utility in order for your system to recognize your new devices (refer to Chapter 5, Mainboard Operations for detailed information regarding system SETUP utility.)

You may also have to change some of the jumper settings on your mainboard. Refer to Chapter 5, Mainboard Operations to find the correct settings.

Before You Begin

In order to install or connect additional devices to your system or, you have to remove the cover of your system. Before you do this, read the following suggestions and precautions on removing the cover. They may help to save you some time and frustration.

1. Turn the power OFF and unplug your system and your peripherals.

2. Clear your work area as much as is practical.

3. Your work area should be large enough to allow easy access to the rear of your computer and have enough room to layout the devices you are installing.

4. Remove everything from the top of your computer (monitor, etc.). If necessary, disconnect your monitor.

5. Find a cup to hold loose screws.

6. Find a Phillips-head screwdriver and a regular flat-head screwdriver.

Removing the Cover

The instructions that follow explain how to remove your cover. Refer to the Figures 7-1 and 7-2 as necessary.

Danger

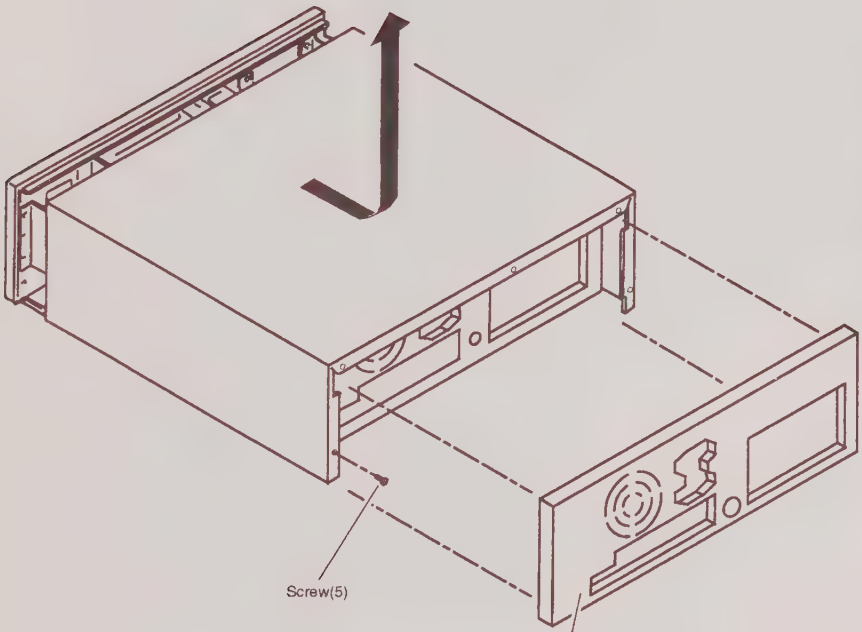
- The system's power supply contains AC voltage at levels that can cause injury or death on contact. Before removing the cover, turn off the system and unplug the system's power cord from the wall outlet or surge suppressor.
- Electro Static Discharge (ESD). Many of the computer system's internal components are extremely sensitive to static electricity. Discharge your body's static-electric charge by touching a grounded surface (such as, touching the computer chassis if the power connector is connected to a a three-prong wall outlet or surge suppressor) before performing any internal adjustments and/or changes.
- If you must turn the power on while the cover is off, follow these precautions:
  - Remove any metal jewelry — they can conduct electricity from the unit to you.
  - Do not leave any loose items in the system — a loose screw can cause damage to the system and possible injury to you.
  - Do not touch items inside the unit while the power is on.

Caution

- Use sufficient force to remove the cover but do NOT shake or rattle your computer.
- Do NOT pry the cover loose. You may cause permanent damage to the chassis.

To remove the cover:

1. Remove the Phillips head screws that hold the cover in place. Place the screws in the cup for reuse.
2. With the back of the computer facing you, grasp the cover firmly on either side and gently pull the cover toward yourself. Lift the cover off completely and set it aside.

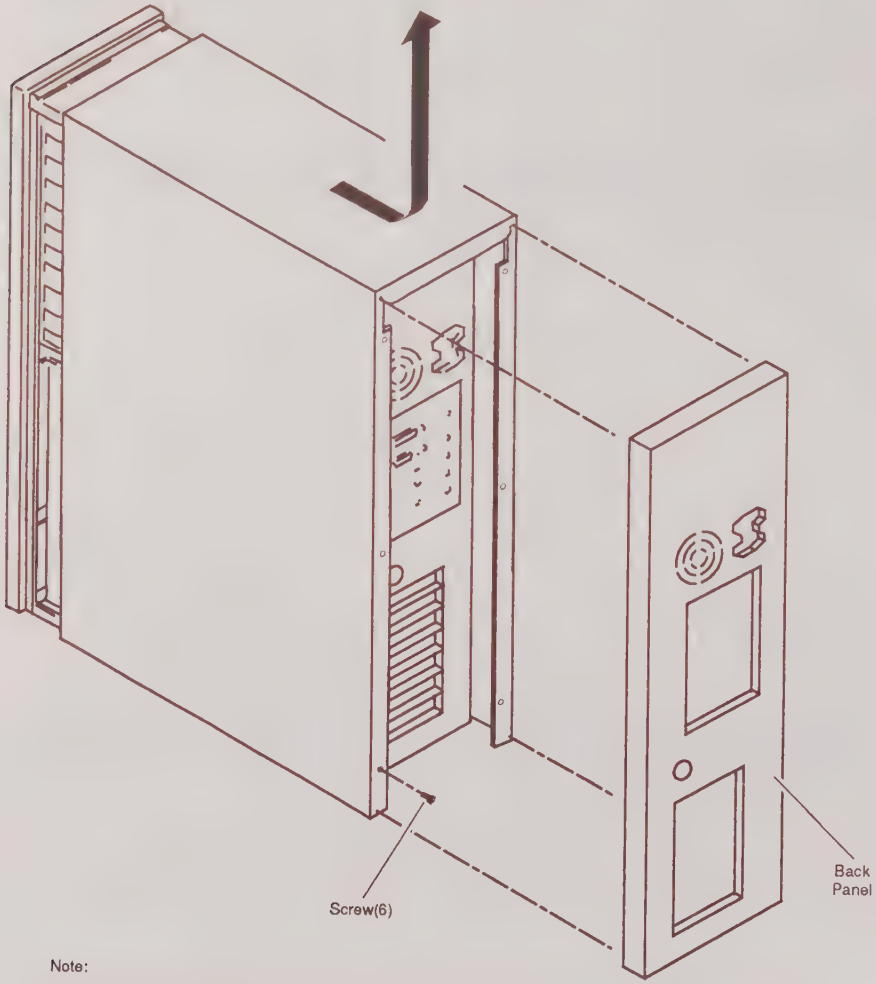


Note:

Remove back panel and pull cover toward rear of system and lift off. Be carful of the cables and wires inside the system so that you do not accidentally pull one as you remove the cover.

01000Z

Figure 7-1. Desktop Cover Removal



Note:

Remove back panel and pull cover toward rear of system and lift off. Be carful of the cables and wires inside the system so that you do not accidentally pull one as you remove the cover.

01002Z

Figure 7-2. Vertical Cover Removal

What's Inside Your Computer

Now that you have the cover off, take a close look at the inside of your computer. Figures 7-3 and 7-4 shows an example of how your computer may look inside. Internal arrangements vary from one system to the next, but this example is typical. The significant parts are labeled and you should be able to locate them inside your system.

The interior of your computer is divided into two functional sections. The power supply is on the right. The disk drives are in the center. Depending on the type of system you have, there is room for six or more additional internal devices, such as floppy drives, CD-ROM, tape backup, and/or hard drives. The expansion slots for peripherals an add-on boards are on the left.

In a desktop system, the mainboard lays flat on the bottom left side.

Seated on the mainboard is a peripheral controller which divides the internals between drives and add-on slots. The front of the mainboard holds the SIMMs; the back has expansion slots (connectors).

The expansion slots are for installing add-on boards. Add-on boards provide the additional functions and ports necessary to connect a variety of peripheral devices. They may also be used for installing an internal peripherals (e.g., modem, backup tape drive, etc.) or for adding additional memory.

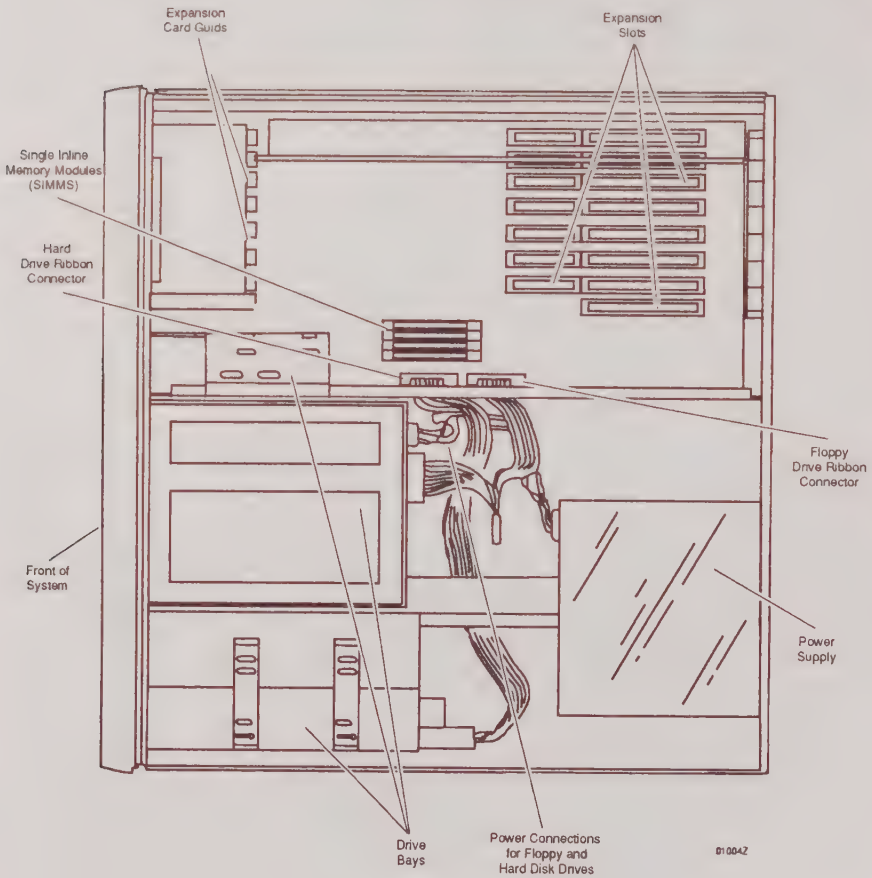


Figure 7-3. Typical Desktop Internal Configuration

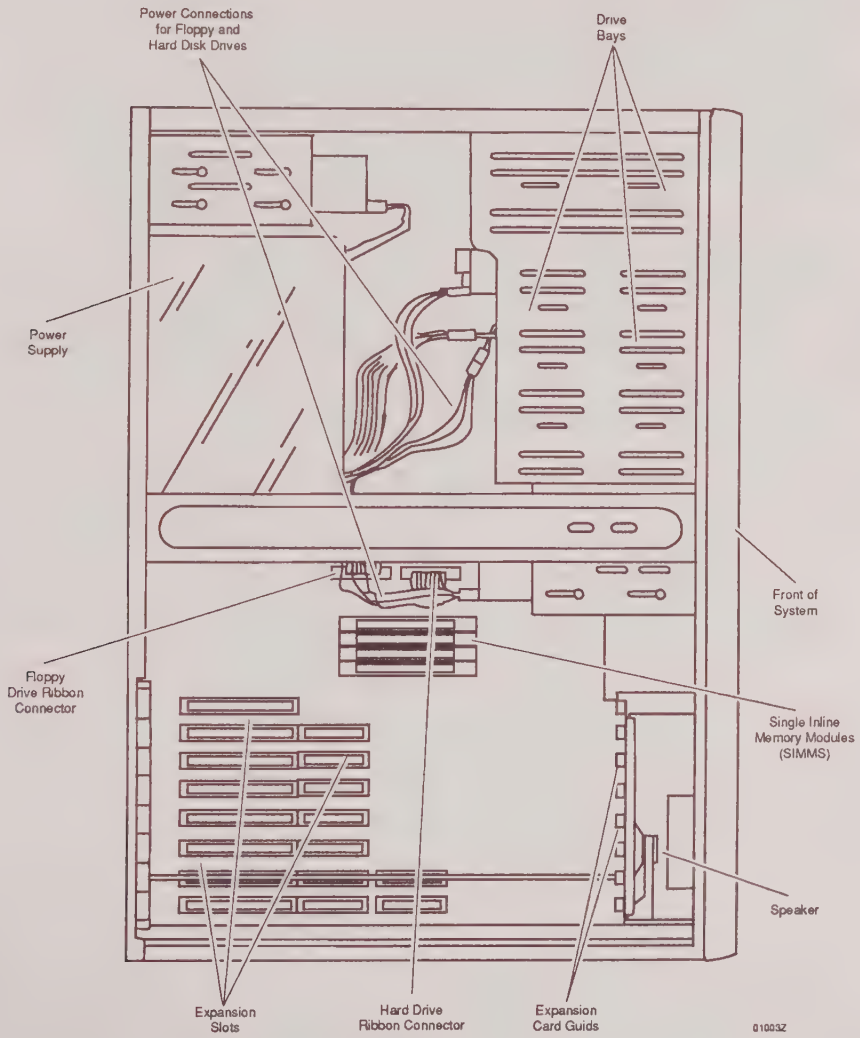


Figure 7-4. Typical Vertical Internal Configuration

Add-On Boards

Before you install an additional board for more serial or parallel ports, refer to the manufacture's documentation to determine whether the board is set to COM1, COM2, COM3, etc. (serial ports) or LPT1 or LPT2 (parallel ports). Most ZEOS systems include two serial ports (COM1 and COM2), one parallel, and a video port.

Your system mainboard automatically determines if a expansion board is installed, then automatically reconfigures the on-board peripheral interfaces to the first free I/O address. That is, I/O addresses that are not assigned to the installed expansion card.

> **Note:** If your configuration includes a modem and a mouse, do not install them as COM1 and COM3 (these ports share the same interrupt sequence). Use COM1 and COM2 or COM1 and COM4.

You may also find it helpful to review the information and illustrations that follow before you install an add-on board in your system.

> **Note:** Refer to Chapter 5, Mainboard Operations for a functional description of the ports.

Bus Connectors

Along the bottom edge of all add-on boards are gold fingers or bus connectors. This is the part that fits into the expansion slot on your mainboard. These fingers are arranged into various groupings on the expansion board, depending on the type of expansion board.

Depending on your system configuration, the following types of bus connectors may be used in your system:

- one group of eight (8-bit ISA bus connector),
- two groups of eight (16-bit ISA bus connector),
- two groups of eight, one group of 32 (32-bit VESA local bus connector), or
- one group of 32 (32-bit EISA bus connector) for EISA systems only.

> **Note:** The 32-bit VESA local bus connector(s) are primarily used for high speed video adapter and network expansion boards etc.. The VESA local bus expansion slot(s) moves information at the same speed as your processor in a 32-bit path. Refer to Chapter 5, Mainboard Operations for detailed information regarding the VESA local bus expansion slot(s).

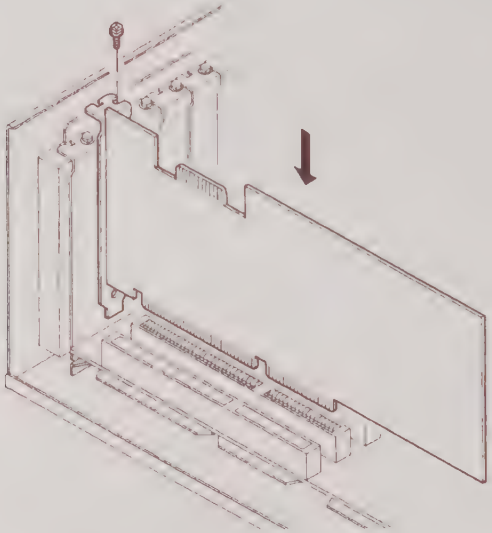


Figure 7-5. Bus Connectors

Expansion Slots

Now look at the expansion slots inside your computer. Notice that the slots are in groups of eight or 16 (ISA bus) and one group of 32 (VESA local bus). The gold fingers on your board fit into the slots. An 8-bit bus connector fits into the 8-bit expansion slot. An 8-bit bus connector also fits into any 16-bit expansion slot, but only connects to the first group of 8-bits. A board with a 16-bit bus connector will fit into any of the 16-bit expansion slots.

A VESA local bus expansion board utilizes one 16-bit ISA bus slot and one 32-bit VESA local bus slot. Refer to Chapter 5, Mainboard Operations for additional information regarding the VESA local bus expansion slot(s).

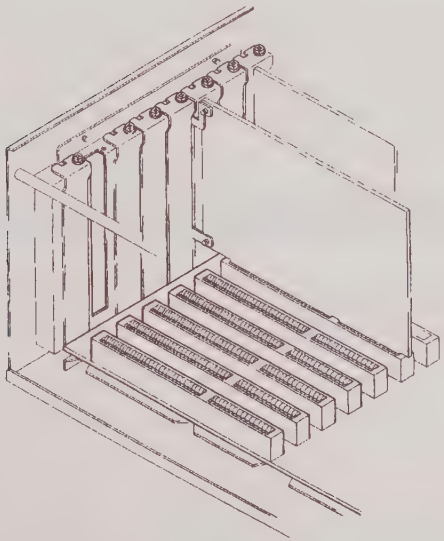


Figure 7-6. 16-Bit Expansion Slots

Installing an Add-On Board

The instructions that follow provide general instructions how to install an add-on board. For detail installation instructions, refer to the add-on board's instruction manual.

Warning

The following instructions assume that you have already turned off the power, unplugged the system and peripherals, and removed the cover.

Decide which expansion slot you want to use to install your add-on board.

1. Remove the expansion slot cover you chose by removing the screw that holds it in place. The slot cover(s) is located on the backpanel of your computer, directly in line with the expansion slots.

2. Place the screw in the cup with the hex screws from your cover. You will need it to secure the add-on board.

Danger

Do not drop the screw inside your computer. If you do, find it and remove it. A piece of loose metal on or around the mainboard could cause a short circuit and damage the computer.

3. Insert the add-on card in the slot. Press carefully on the top edge of the card until the card is seated properly.

4. Fit the port connection into the back of the computer where the slot cover was.

5. Secure the mounting bracket of the add-on board using the slot cover screw.

Adding Memory

Another way to add to your system is to install additional memory in the form of RAM chips or SIMMs. RAM stands for random-access-memory. It is the portion of your system's memory that is able to temporarily hold data so that it may be read and written to as long as your computer is on. When you turn your computer off, the data is lost unless you save it in permanent memory.

You can add additional memory with SIMMs (Single-In-line Memory Modules) or DIP (Dual-Inline Package) boards. Both memory devices are available in a number of sizes and speeds. Faster and slower memory chips may be intermixed.

The SIMMs may be installed directly on your system board. If your system board does not have room for additional SIMMs, in many cases you can install larger capacity SIMMs. You can also install a memory expansion board.

Danger

You must be careful to install chips whose speed of operation is compatible with your system's mainboard. Refer to Chapter 5, Mainboard Operations for information on the proper SIMM(s) to use, how to install them, and which memory banks must be filled for the system to operate.

If your system has more than 1MB of memory, you may need memory manager software in order for your applications to actually take advantage of the additional memory. The purpose of these software memory managers is to expand the amount of memory that your system is able to use at one time.

If you would like more information on expanded memory managers, refer to Using EMM386.EXE in your MS-DOS User's Guide.

Changing the System On-Board Battery

Caution

Before changing the battery, ensure you have noted your system SETUP configuration in the table provided in Chapter 1, System Overview. Refer to Chapter 5, Mainboard Operations for information about accessing SETUP.

If the internal on-board battery that powers your system clock and the CMOS chip becomes discharged or becomes dislodged, a message similar to "CMOS battery low" or "CMOS checksum error" is displayed on your monitor. You should replace the battery immediately.

The system battery is installed on the directly on your system mainboard. To replace, simply lift up slightly on the battery retaining spring and slide out the old battery.

> **Note:** You will have to run SETUP and re-enter all previous system values after changing the battery. Refer to Chapter 5, Mainboard Operations for SETUP information.

Caution

Danger of explosion if battery is not replaced with the same or equivalent type battery. Discard used battery according to the battery manufacturer's instructions.

Chapter 8 — Using MS-DOS

This chapter provides basic DOS concepts and introduces the most commonly used commands and operations. For detail information about advanced concepts, commands, and features, refer to your MS-DOS User's Manual.

Overview

MS-DOS or "DOS" is the operating system that controls your system. It also offers various functions that let you control the computer directly. For example, DOS permits you to prepare floppy disks without having to work through another software application. At first, DOS may seem complex, but it is no more complex than the language and concepts that you use in your own job. Understanding the basic DOS concepts will permit you to become more effective.

Most applications let you perform DOS-related tasks without using DOS directly. It is very possible to use your system while knowing very little about DOS. But, the better you understand DOS, the more effective you will be.

> **Note:** When typing DOS commands, DOS does not distinguish between uppercase and lowercase letters entered from the keyboard.

What Are Files

Files (and directories) are used to store information (or data). A file consists of related data stored on the hard drive or floppy disk. For example, a computer file can be best compared to a physical file holder stored in a file cabinet. Each file is assigned a unique name, just like you would write a name on the file folder tab.

Naming Files

Each file is given a unique name so you and DOS can identify the file. Each filename should give some indication of the file contents and the type of file it is, such as JETMEMO.DOC.

Filenames

A filename contains two parts; the filename and an optional extension which is separated by a period. The filename can have up to 8 characters usually consisting of letters and numbers. Spaces or any of the following symbols are not recognized by DOS.

\.?/:;"[]+=*

DOS verifies your filename and indicates if the filename is valid.

Extensions

Each extension can have up to 3 characters. Spaces or any of the following symbols are not recognized by DOS.

\ . ? / : ; " [ ] + = *

For instance, for the file called JETMEMO.DOC, JETMEMO is the filename and .DOC is the extension.

DOS uses unique extensions for certain type files. Never use the following extensions in your files unless noted otherwise.

Extensions	Type of File
.BAK	Backup
.BAT	Batch
.COM	Command
.EXE	Executable
.SYS	System

Note: You can create batch files, but never use the .BAT extension for other files.

.COM and .EXE files are program files that provide the system with operating instructions. Some application programs add their own extensions to files, such as .DOC for document files.

What Are Directories

Directories (and files) are used to store information (or data).

A directory consists of a collection of files. For example, a directory can be best compared to a physical file cabinet you use to store your file folders. For example, all memo files for a particular department could be stored in a drawer (directory) marked DEVELOPMENT.

You store computer files in a similar method using directories on the hard drive or floppy disk.

DOS allows you to create and delete directories, and switch from one directory to another. The directory you are currently working in, is referred to as the current or working directory.

Creating a New Directory

New directories can be created on your system to organize file. Always name new directories using the same rules followed for naming files.

The DOS command MD (Make Directory) is used to create a directory. For example, to make a new directory called PROJECT in the root directory on the hard drive:

At the C: prompt, type:

`md project` **Enter**

Nothing is changed on your display, but the system creates this directory on the hard drive.

A directory within a directory (is called subdirectory) can also be created. For example, if you have several memos to the same individual. Simply create a subdirectory with the MEMOS directory called JET as follows:

At the C: prompt, type:

`md memos\jet` **Enter**

Changing Directories

When you turn on your system, you are at the root (main) directory.

To change to other directories to locate files and programs, use the DOS command CD (Change Directory). For example, to change from the root directory to the MEMOS directory:

At the C: prompt, type:

`cd memos` **Enter**

To return to the root directory:

At the C: prompt, type:

`cd\` **Enter**

Removing Directories

To remove a directory from your system to free up some space for other files or directories, use the DOS command RD (Remove Directory).

The following guidelines should be used before removing a directory:

- You cannot remove the root directory.
- You cannot remove the current directory.
- You can only remove one directory at a time.
- You can only remove a directory after removing all of its related subdirectories.
- You can only remove a directory or subdirectory after deleting all files in it.

For example, to remove the MEMOS directory from the hard drive:

1. Delete all files in the MEMOS directory. (Refer to Deleting Files in this section.)

2. Go to the root directory by entering:

   `cd\` **Enter**

3. Remove the MEMOS directory by entering:

   `rd memos` **Enter**

Specifying Files

To locate a file, DOS needs to know the drive and directory where the file is located as well as the filename and extension. This combination is called the path.

Files are specified in two ways. For example, to delete a file called JET.DOC in the MEMOS directory on the hard drive, type:

`del \memos\jet.doc` **Enter**

The alternative method is to change to the directory containing the file as follows, type:

`cd \memos` **Enter** (this changes the current directory to MEMOS)

then type:

`del jet.doc` **Enter**

The first method identifies the directory in which to look; in the second method, the computer automatically looks in the current directory.

Listing Files

To list all files in a directory use the DIR command (list DIRectory). This command directs the system to list each filename, file size (in bytes), and the date and time the file was created. This command also indicates the remaining space on the disk.

To list the files in the MEMOS directory, type:

`dir \memos` **Enter**

You could also change to the MEMOS directory (using the CD command), then just type:

`dir` **Enter**

If the list of files is longer that one screen, the system scrolls the screen faster than you are able to read them. To display the files one screen at a time, type:

`dir c:\memos /p` **Enter** or,

`dir /p` **Enter** (if you changed directories)

To list the files across the screen, type:

`dir c:\memos /w` **Enter** or,

`dir /w` **Enter** (if you changed directories).

This displays the filenames and extensions in five columns across the screen.

Changing Filenames

To change the filename use the REN command (RE-Name). For example, to rename the JET.DOC file to JLENO.DOC in the MEMOS directory, type:

`ren c:\memos\jet.doc jleno.doc` **Enter**

Reading Files

To look at a file on the screen without changing it, use the TYPE command. For example, to read the JLENO file in the MEMOS directory, type:

`type c:\memos\jleno.doc` **Enter** or,

`type jleno.doc` **Enter** (if you changed directories)

When reading files, do not use the extensions .COM and .EXE as these are reserved for special files.

Copying Files

Use the COPY command to copy files from:

- Floppy disk to hard drive.
- Floppy disk to another floppy disk.
- Hard drive to floppy disk.

The system copies all files into the current directory unless otherwise specified.

To copy a file, you specify the:

- Drive the file is located.
- Directory the file is stored.
- Filename.
- Drive where you want the file copied.
- Directory where you want the copied.
- Name of the file copy (if you want to change the name). You must change the name if you are putting the copy in the same directory as the original file.

For example, to copy the JET.DOC file from a floppy disk into the MEMOS directory on the hard drive:

Insert the floppy disk into the floppy drive; type:

`copy a:jet.doc c:\memos\jet.doc` **Enter** or,

`copy a:jet.doc` **Enter** (if you changed to the MEMOS directory)

For information about using the MS-DOS wildcards (* and ?) to copy files, refer to your MS-DOS User's Guide.

Deleting Files

To delete a file use the DEL command (DELete). For example, to delete a file named JET.DOC in the MEMOS directory, type:

`del c:\memos\jet.doc` **Enter** or,

`del jet.doc` **Enter** (if you changed directories)

For information about using the MS-DOS wildcards (* and ?) to delete files, refer to your MS-DOS User's Guide.

Checking a Disk

To check the capacity of the drive and the space available for storage, use the CHKDSK command. For example, to check the condition of the current drive, type:

`chkdsk` **Enter**

To stay at the current drive and check another drive, type:

`chkdsk a:` **Enter**

The capacity of the drive and the remaining byte available for storage are displayed on the screen.

Appendix A — Getting Help

This appendix explains when and how to call ZEOS for technical assistance, customer service, and sales assistance. It also provides telephone numbers for contacting ZEOS.

Before Calling Technical Support

ZEOS is please to provide our customers with award-winning 24-hour, 7 days a week, telephone technical assistance, but we need your help too.

If you are experiencing a problem, you'll be pleased to learn that actual hardware failures are rarely the cause of technical problems. In most cases, most problems are simple and can be resolved by you, using basic troubleshooting techniques outlined in your Before Calling ZEOS Technical Support Handbook.

We request that you refer to your Before Calling ZEOS Technical Support Handbook prior to calling ZEOS.

- Complete the problem solving techniques outlined in the Before Calling ZEOS Technical Support Handbook.
- Reference the troubleshooting information sections in any other hardware and software user manual's provided with your system.

Calling For Technical Assistance

After completing the above items, before calling, if possible, turn your computer on and call from a telephone at or near your system. Your ZEOS technical support representative may ask you to type some MS-DOS commands at the keyboard.

- Serial number
- Make and model of any hardware connected or installed
- Type and version of any network you are using (if applicable)
- Name and version of any software installed
- Contents of CONFIG.SYS file
- Contents of your AUTOEXEC.BAT file

You may also be asked to furnish the system ship date, your customer ID, and a credit card number and expiration date.

Telephone Numbers

Technical Support

Toll free (US, Canada and Puerto Rico)	800-228-5390
Direct dial	612-633-7337
FAX	612-633-4607
BBS (Modem required, settings 8,N,1	612-633-0815

TDD lines for the hearing impaired

Toll free (US, Canada and Puerto Rico)	800-228-5389
Direct dial	612-633-5224

Sales and Customer Service

Contact your ZEOS System Consultant for information on additional ZEOS products and optional equipment.

Domestic Sales

Toll free (US, Canada and Puerto Rico)	800-423-5891
Direct dial	612-633-4591
FAX	612-633-1325

International Sales

Direct dial	612-633-6131
FAX	612-633-9503

Government & Education Sales

Toll free (US, Canada and Puerto Rico)	800-245-2449
Direct dial	612-633-0117
FAX	612-639-9459

TDD lines for the hearing impaired

Toll free (US, Canada and Puerto Rico)	800-228-5389
Direct dial	612-633-5224

Customer Service

Toll free (US, Canada and Puerto Rico)	800-848-9022
Direct dial	612-633-9225
FAX	612-633-0110

> **Note:** Telephone numbers are subject to change without notice. If you experience difficulty in contacting us, please contact Directory Assistance or "800" Information for the most current telephone numbers.

The Glossary

This glossary provides generalized definition of key terms. Terms are listed in alphabetical order. Synonyms are provided where applicable.

For additional explanation of terms, refer to standard texts and reference books on microcomputers.

Access Time

Time required to perform an ACCESS. Usages, e.g.: 1) seek to location on a disk, 2) amount of time to read or write to a memory location, 3) the time to position to the correct location in a disk drive and carry out a read or write operation.

ACCESS TIME is often defined as the time from the leading edge of the first step pulse received to SEEK COMPLETE (including settling).

Actuator

See HEAD POSITIONER. The two basic types of actuators are steppers and voice-coils. Open-loop steppers generally cannot achieve tracks per inch (TPI) as high as the closed-loop system because of the lack of feed back on track positioning accuracy. In open-loop stepper drives, mechanical tolerances are one of the most significant factors in limiting TPI enhancement.

Address

(Physical) A specific location in memory where a unit record, or sector, of data is stored. To return to the same area on the disk, each area is given a unique address consisting of three components: cylinder, sector, and head. CYLINDER ADDRESSING is accomplished by assigning numbers to the disk's surface concentric circles (cylinders). The cylinder number specifies the radial address component of the data records (sectors) from an index that defines the reference angular position of the disks. Index records are then counted by reading their ADDRESS MARKS. Finally, HEAD ADDRESSING is accomplished by vertically numbering the disk surfaces, usually starting with the bottom-most disk data surface. For example, the controller might send the binary equivalent of the decimal number 610150 to instruct the drive to access data at cylinder 61-, sector 15, and head 0.

Address Mark

Two byte address at the beginning of both the ID field and the data field of the track format. The first byte is the "A1" data pattern, the second byte is used to specify either an ID field or a data field.

Adjustable Interleave

Interleaving permits access to more than one memory module, e.g., if one memory module contains odd-numbered address and another even-numbered address, they can both be accessed simultaneously for storage. If the interleave is adjustable, the user may select which ranges or areas are to be accessed each time.

Application Program

Computer program that performs a wide range of tasks as specified by the user. Examples of application programs include word processors, spreadsheets, and desktop publishing programs. Often times simply called application or program.

Areal Density

Bit density (bits per inch, or BPI) multiplied by track density (Tracks per inch, or TPI), or bits per square inch of the disk surface. Bit density is measured around a track (circumferential on the disk), and track density is radially measured.

ASCII

American Standard Code for Information Interchange. A standardized coding system for representing characters, such as numbers, letters, and graphic symbols. An ASCII character occupies one byte of storage. Files transmitted in ASCII code can be used by many different computers, printers, and programs.

Asynchronous

A method of data transmission in which one machine sends data one character at a time to another, without either machine preparing for the transmission.

AUTOEXEC.BAT File

A MS-DOS batch file containing commands which execute automatically when you turn on your computer. See Batch File.

Automatic Back Up of Files

This gives a user the security to make changes to a file without worrying about accidentally destroying it; there is always another copy. One weakness of this method is that files take up twice the room on a disk.

Average Access Time

The average track access time, calculated from the end of the CONTROLLER commands to access a drive, to drive seek complete time averaged over all possible track locations at the start of ACCESS, and over all possible data track ADDRESSES. Typically, the minimum average access time including carriage settling for open loop actuators is less than 85 msec. and for voice coil disk drives is less than 40 msec. As technology improves these times will continue to decrease.

Backup

A term used to denote the archiving or duplication of files stored on various types of media (e.g., floppy disk, tape, etc.) in case your working copy is damaged or lost.

Batch File

A file containing several command that execute in sequence as a group, or batch. MS-DOS batch files must have a filename extension of .BAT. See Command.

Baud Rate

A variable unit of data transmission speed equal to one bit per second.

Bidirectional Bus

A bus that may carry information in either direction but not in both simultaneously.

Bit Cell Length

Physical dimension of the bit cell indirection of recording along the disk circumference of a track.

Bit Density

Expressed as BPI (for bits per inch), bit density defines how many bits can be written onto one inch of a track on a disk surface. It is usually specified for worst case, which is the inner track. Data is the densest in the inner tracks where track circumferences are the smallest.

Bit Shift

A data recording effect, which results when adjacent 1's written on a magnetic disks repel each other. The worst case is at the inner cylinder where bits are closest together. BIT SHIFT is also called pulse crowding.

BIOS

Basic Input/Output System. A collection of information (firmware) that controls communication between the Central Processor and its peripherals.

Bit

A binary digit (0 or 1). The smallest unit of computer storage. The value of a bit represents the presence (1) or absence (0) of an electric charge.

Boot

Short for Bootstrap. Transfer of a disk operating system program from storage on floppy disk or hard disk drive to computer's working memory.

Boot Disk

A disk with an operating system installed which loads the system on power up.

Byte

A sequence or group of eight bits that represent one character.

Cache

See SRAM Cache.

Cache Memory

Cache Memory allows the system to load bytes of data from the hard disk to memory. The system may then refer to memory for information instead of going back to the hard disk, thereby increasing the processing speed.

Cathode-Ray Tube

CRT. The primary element in a monitor, which projects information on the screen.

Character

Anything that can print in a single space on the page or the screen. Includes numbers, letters, punctuation marks, and graphic symbols.

Chip

An integrated circuit fabricated on a chip of silicon or other semiconductor material, e.g., a CHIP is an integrated circuit, a microprocessor, memory device, or a digital logic device.

Clock Rate

The rate at which bits or words are transferred between internal elements of a computer or to another computer.

CMOS

Complementary Metal-Oxide Semiconductor. A method for making silicon chips.

Code

A set of unambiguous rules specifying the way which digital data is represented physically, as magnetized bits, on a disk drive. One of the objectives of coding is to add timing data for use in data reading. See DATA SEPARATOR, MFM and RLL. A system of symbols for representing data or instructions. Also any software program or part of a program.

Command

An instruction you enter on the keyboard to direct your computer to perform a specific function.

Command Processor

The part of an operating system that processes commands entered by you. The command processor in MS-DOS is contained in the COMMAND.COM file.

Configuration

The particular setup of a group of components. For example, a computer with a keyboard, a hard drive, two floppy drives connected to a monitor and a printer can be considered a typical system configuration.

Control Code

A command (generated when you hold down Ctrl and press another key on the keyboard) that instructs your computer to perform a specific function.

CPU

Central Processing Unit. The piece of hardware which interprets instructions, performs the tasks you indicate, keeps track of stored data, and controls all input and output operations.

Crash

A malfunction in the computer hardware or software, usually causing loss of data.

CRT

See Cathode-Ray Tube.

Cursor

The highlighted marker which shows your position on the screen and moves as you enter and delete data.

Cyclic-Redundancy-Check

(CRC.) Used to verify data block integrity. In a typical scheme, 2 CRC bytes are added to each user data block. The 2 bytes are computed from the user data, by digital logical chips. The mathematical model is polynomials with binary coefficients. When reading back data, the CRC bytes are read and compared to new CRC bytes computed from the read back block to detect a read error. The read back error check process is mathematically equivalent to dividing the read block, including its CRC, by a binomial polynomial. If the division remainder is zero, the data is error free.

Data

Information stored or processed by a computer.

Data Address

To return to the same area on the disk, each area is given a unique address consisting of the three components: cylinder, head and sector. Horizontal: accomplished by assigning numbers to the concentric circles (cylinders) mapped out by the heads as the positioning arm is stepped radially across the surface, starting with 0 for the outermost circle. By specifying the cylinder number the controller specifies a horizontal or radial address component of the data read. Rotational: once a head and cylinder have been addressed, the desired sector around the selected track of the selected surface is found by counting address marks from the index pulse of the track. Remember that each track starts with an index pulse and each sector starts with an address mark. Vertical: assume a disk pack with six surfaces, each with its own read/write head, vertical addressing is accomplished by assigning the numbers 00 through XX to the heads, in consecutive order. By specifying the head number, the controller specifies the vertical address component of the data area.

Data Disk

A formatted floppy disk used to store files.

Data Transfer Rate

Speed at which bits are sent. In a disk storage system, the communication is between CPU and controller, plus controller and the disk drive. Typical units are bits per second (BPS), or bytes per second, e.g., ST506/412 INTERFACE allows 5 Mbits/sec. transfer rate.

Density

Generally, bit recording density. SEE AREAL, BIT, and STORAGE DENSITY.

Diagnostics

The tests and procedures the computer performs to check its internal circuitry and set up its configuration.

DIP Switches

Small switches on a piece of hardware such as a CPU, a printer, or an option card. DIP switch settings control various functions and provide a system with information about itself. DIP stands for Dual In-Line Package.

Directory

A list of the files stored on a disk or a part of a disk. Disk. The collective term for both hard disks and floppy disks (diskettes).

Disk Drive

The physical device which allows the computer to read from and write to a disk. A floppy disk drive has a disk slot into which you insert floppy disks. A hard disk is permanently fixed inside the main unit.

Disk/Platter

For rigid (hard) disks, a flat, circular aluminum disk substrate, coated on both sides with a magnetic substance (iron oxide or thin film metal media) for non-VOLATILE data storage. The substrate may consist of metal, plastic, or even glass. Surfaces of disks are usually lubricated to minimize wear during drive start-up or power down.

Disk

A flat piece of flexible plastic coated with magnetic material and used to store data permanently. Also called a floppy disk.

DOS

Disk Operating System. A computer program which continuously runs and mediates between the computer user and the Application Program, and allows access to disk data by disk filenames. The Disk Operating System controls the computer's input and output functions. See Operating System.

Double-Density

A type of floppy disk format that allows you to store twice as much data as the standard-density format. A double-density floppy disk has a storage capacity of 360KB on 5 ¼" or 720K on 3 ½" floppy disks.

Drive Select

An ADDRESS component that selects among a string of drives attached to a disk controller. In the ST 506/412 interface standard, a drive's select code is physically set in the drive to a value between 0 and 3. When the controller activates one of the four drive select code lines in the J1 cable, the selected drive is enabled to respond to access commands from the controller.

ESDI

ENHANCED SMALL DEVICE INTERFACE. A set of specifications for the drives. With this type of controller and hard drive, some of the controller functions are incorporated into the drive. The purpose of this is to reduce the amount of time needed to transfer data. See also SCSI.

FAT

See File Allocation Table.

FCI

FLUX CHANGES PER INCH. Synonymous with FRPI (Flux reversals per inch). In MFM recording 1 FCI equals 1 BPI (bit per inch). In RLL encoding schemes, 1 FCI generally equals 1.5 BPI.

File

A group of related pieces of information called records, or entries, stored together on disk. Text files consist of words and sentences. Program files consist of codes and are used by computers to interpret and carry out instructions.

File Allocation Table

FAT. A portion of a disk used by MS-DOS to store a file-storage map showing which parts of a disk are allocated to what file or part of a file.

Firmware

A computer program written into a storage medium which cannot be accidentally erased, e.g., ROM. It can also refer to devices containing such programs.

Fixed Disk

See Hard Disk Drive.

Floppy Disk

See Disk.

Flux Change

Location on the data track, where the direction of magnetization reverses in order to define a 1 or 0 bit.

FM

Frequency modulation. CODE scheme, superceded by MFM, which is being superceded by RLL.

Format

To prepare a new disk (or erase an old one) so it can receive information. Formatting a disk divides it into tracks and sectors which create addressable locations on it.

Formatted Capacity

Actual capacity available to store user data. The formatted capacity is the gross capacity, less the capacity taken up by the overhead data used in formatting the disks. While the unformatted size may be 24 Mbytes, only 20 Mbytes of storage may actually be available to the user after formatting.

Full Height Drive

Hard drive 5 ¼" drive which takes up two half-height drive bays.

Gap

Format: Part of the disk format. Allows mechanical compensations (e.g., spindle motor rotational speed variations) without the last sector on a track overwriting the first sector.

Head: An interruption in the permeable head material, usually a glass bonding material with high permeability, allowing the flux fields to exit the head structure to write/read data bits in the form of flux changes on the recording media.

Gap Length

Narrowing the head gap length achieves high bit density because the lines of force magnetize a smaller area where writing data in the form of flux changes on the recording media.

Gap Width

The narrower the gap width, the closer the tracks can be placed. Closer track placement results in higher TPI.

Graphics

Lines, angles, curves, and other nonalphanumeric data.

GW-BASIC

Microsoft's extended version of the Beginner's All-purpose Symbolic Instruction Code. A programming language designed to be easy to use and understand.

Half Height Drive

A Hard drive which fits in one half of the space of a full height mini-floppy drive.

Hard Disk Drive

Commonly called rigid disk drives, or hard disk drives.

Though similar to floppy disk drives, the hard disks have higher bit density and multiple read/write surfaces. The unit is enclosed and is used to store data permanently. Unlike a floppy disk, it is fixed in place. It can process data more rapidly and store many more files than a floppy disk.

Hard Error Map

Also called defect map, bad spot map, media map. Media defects are avoided by deleting the defective sectors from system use, or assigning an alternative track (accomplished during format operation). The defects are found during formatting, and their locations are stored on a special DOS file on the disk, usually on cylinder 0.

Hardware

Any physical component of a computer system, such as a monitor, printer, keyboard, or CPU.

Head

An electromagnetic device that can write (record), read (playback), or erase data on magnetic media.

Head Crash

A head landing occurs when the disk drive is turned on or off. This function normally does not damage the disk as the disk has a very thin lubricant on it. A head crash occurs when the head and disk damage each other during landing, handling or because a contaminant particle gets between them. Head crash is a catastrophic failure condition and causes permanent damage and loss of data.

Head Landing Zone

An area of the disk set aside for takeoff and landing of the hard disk heads when the drive is turned on and off.

Head Positioner

Also known as the ACTUATOR, a mechanism that moves the read/write heads to the cylinder being accessed.

High Density

Floppy disks which store more data than a double density floppy disk.

IDE

Integral Device Equipment. Also, IDE is an acronym for Integrated, Intelligent or Imbedded Drive Electronics. An IDE drive has the controller electronics built into the drive itself and is connected directly to the mainboard or to an adapter card. The IDE drives use the same method of storage as the RLL drives.

Input/Output Port

See Port.

Intelligent Peripheral

A peripheral device that contains a processor or microprocessor to enable it to interpret and execute commands, thus relieving the computer for other tasks.

Interface

A physical or software connection used to transmit data between equipment or programs. The protocol data transmitters, data receivers, logic and wiring that link one piece of computer equipment to another, such as a disk drive to a controller or a controller to a system bus. Protocol means a set of rules for operating the physical interface, e.g., don't read or write before SEEK COMPLETE is true.

Interface Standard

The interface specifications agreed to by various manufacturers to promote industry-wide interchangeability of products such as disk drives and controllers. An interface standard generally reduces product costs, allow buyers to purchase from more than one source, and allows faster market acceptance of new products.

Interleave Factor

The ratio of physical disk sectors skipped for every sector actually written.

Interleaving

The interleave value tells the controller where the next logical sector is located in relation to the current sector. For example, an interleave value of one (1) specifies that the next logical sector is physically the next sector on the track. Interleave of two (2) specifies every other physical sector, three (3) every third sector and so on. Interleaving is used to improve the system throughout based on overhead time of the host software, the disk drive and the controller; e.g., if an application program is processing sequential logical records of a disk file in a CPU time of more than one second but less than two, then an interleave factor of 3 will prevent wasting entire disk revolution between accesses.

Jumper

A small electrical connector that alters some of the computer's functions. Short (makes a connection) or Non-Short (no connection).

Kilobyte (KB)

A unit used to measure storage space (in a computer's memory or on a disk). One kilobyte equals 1024 bytes.

Latency

(ROTATIONAL.) The time for the disk to rotate the accessed sector under the head for read or write. On the average, latency is the time for half of a disk revolution.

LCD

Liquid Crystal Display

LED

Light Emitting Diode. A substance that illuminates when electricity passes through it, like the indicator lights on the front panel of the computer.

Local Bus

A set of addresses, data, and control signals that interface directly with the host CPU.

Mainboard

A printed circuit board into which other circuit boards can be plugged. Usually, it contains the CPU, sockets for memory chips, math coprocessor socket and expansion slots for add-on boards. Also known as a motherboard.

Main Unit

The system's computer unit.

Megabyte (MB)

A unit used to measure storage space (in a computer's memory or on a disk). One megabyte equals 1,048,576 bytes.

Memory

The area where your computer stores data. Memory contents can be permanent and unalterable (ROM) or temporary (RAM).

MFM

Modified frequency modulation. An encoding technique also referred to as double-density, which is used to encode data on a floppy disk. This type of hard drive stores data one bit at a time with a delimiter after each bit. The method of storage that it uses is simple and reliable.

MHz

This stands for Megahertz, or cycles per second.

Microprocessor

A small version of a CPU contained on one semiconductor chip.

Microsecond

One one-millionth of a second: 1/1,000,000 seconds.

Millisecond

One one-thousandth of a second: 1/1,000 seconds.

Modem

A device which allows a computer to transmit signals over telephone lines so it can send and receive data. Modem stands for MOdulator/DEModulator.

Modified Frequency Modulation

(MFM) A method of recording digital data, using a particular CODE to get the flux reversal times from the data pattern. MFM recording is self-clocking because the CODE guarantees timing information for the playback process. The controller is thus able to synchronize directly from the data. This method has a maximum of one bit of data with each flux reversal. (See NRZ, RLL.)

Monitor

The piece of hardware that contains the screen and display information.

Motherboard

See Mainboard.

MS-DOS

An operating system from Microsoft. See DOS, Operating System.

Nanosecond

One one-billionth of a second: 1/1,000,000,000 seconds.

NRZ

NON-RETURN TO ZERO. 1) User digital data bits; 2) A method of magnetic recording of digital data in which a flux reversal denotes a one bit, and no flux reversal a zero bit, NRZ recording requires an accompanying synchronization clock to define each cell time unlike MFM or RLL recording. (No Seagate drives use NRZ recording methods).

Operating System

A collection of programs that allow a computer to control its operations. The Operating System determines how programs run on the computer and supervises all input and output - for example, MS-DOS.

On Board Local Bus

A set of addresses, data, and control signals that are integrated directly on the mainboard. See Local Bus.

Parallel

The type of interface which transmits data in groups of bits. Printers usually use Parallel ports. See Interface, Serial.

Partition

To divide a hard disk drive into separate sections for use by different operating systems.

Partitioning

Method for dividing an area on disk drive for use by more than one disk operating system or for dividing large disk drives into areas which the File Allocation Table (FAT) can deal with when in use.

Peripheral

A device (such as, a printer or a modem) connected to a computer that depends on the computer for its operation.

Port

A physical input/output socket on a computer where you can connect a peripheral.

Precompensation

Applied to write data by the controller in order to partially alleviate bit shift which causes adjacent 1's written on magnetic media physically to move apart. When adjacent 1's are sensed by the controller, precompensation is used to write them closer together on the disk, thus fighting the repelling effect caused by the recording. Precompensation is only required on some oxide media drives.

Program

A disk file that contains coded instructions and tells the computer what to do and how to do it.

Protocol

A set of conventions governing the format of messages to be exchanged within a communications system.

RAM

Random Access Memory. The part of memory that a computer can both read and write to. The programs you use are temporarily stored in RAM. All data stored in RAM is erased when you turn off the power.

Read

To copy data from one area to another. For example, when you open a text file stored on disk, the computer reads the data from the disk and displays it on the screen.

Read/Write Head

The physical device inside a disk drive that reads and records data on the magnetic surface of a disk.

Reset

To reload a computer's operating system so you can retry a task or begin using a different operating system. Resetting clears RAM.

RGB

Red Green Blue. An RGB monitor displays in high-resolution color.

RLL

Run Length Limited. An extension of MFM. The RLL drives use a more efficient method to store data than the MFM drives. Instead of storing one bit at a time, data bits are stored as code words with delimiters between codes. Because of the difference in storage techniques, RLL drive are able to store 50% more data than MFM.

RLL drive generally use plated media. This means that the platters in the drive are coated with a fine metal compound. This type of drive is also very reliable.

ROM

Read Only Memory. A portion of memory that can only be read and cannot be used for temporary storage. ROM retains its contents even when you turn off the power.

RS-232C

A widely-used, standard type of serial interface. You can easily connect RS-232C compatible devices to your computer.

SCSI

Small Computer Systems Interface. A parallel bus standard designed to interface the computer to disks and other peripherals. Requires intelligence in each peripheral.

The SCSI controller is generally used in a network environment since it allows you to connect and control up to seven peripheral devices (e.g., tape drives, hard drives, etc.). It provides a parallel interface (instead of serial) which means that it can transfer data 8 bits at a time (instead of 1 bit). For this reason, storage and retrieval is extremely fast on SCSI controllers and drives.

The SCSI controller is also able to communicate with all of its peripherals at the same time. If commands cannot be implemented immediately they are stacked in a queue.

Another reason the SCSI drive is able to process data so quickly is that it stores data logically rather than physically. It is able to completely ignore any bad sectors on the disk and view the available storage space as one continuous sequence of usable blocks.

Sector

A contiguous section of a disk track that provides an address at which the computer can access data.

Self Test

The initial diagnostics procedures a system performs to check its hardware.

Serial

The type of interface which transmits data one bit at a time. See Interface and Parallel.

Setup

This refers (usually) to the program that is used to load the CMOS data base with input from the user. SETUP sets the date, time, and configuration of disk drives installed on the system.

Software

The programs that enable your computer to perform the tasks and functions you indicate.

SRAM Cache

Is a high speed memory device that is accessed by the 386 microprocessor. Because it is fast, on 386 systems there is never a wait for data to process when it is in the cache. This gives us the term no wait state cache. As the procession runs, the cache stores the most recently accessed data from the RAM system, and attempts to store data most likely to be accessed next by the 386. As a statistical average in real life applications, the cache system has the data the 386 processor needs 80% to 95% of the time.

SRAM (Static RAM)

SRAM are the high speed, special purpose memory devices used to implement cache memory. These devices are generally much faster than the more common DRAMs, and do not need a refresh cycle. They are also more bulky and expensive. SRAM is an acronym for Static Random Access Memory.

Subdirectory

A directory that originates from another directory (the root directory or another directory). Subdirectories branch out from other directories.

System Disk

A disk that contains the operating system. A Boot Disk.

Tracks

Addressable concentric circles on a floppy disk, resembling the grooves on a record which help to divide the floppy disk into separate accessible areas. There are 40 tracks on each side of a double-sided, double-density floppy disk and 80 tracks on each side of a double-sided, high-density floppy disk.

Tunnel Erase

An erase scheme where both sides of the recorded data is erased when writing data to eliminate track to track interference. This is primarily used on floppy disk drives.

Unformatted

(Capacity.) Drive byte capacity before formatting. Maximum capacity of a disk drive before formatting = (bits per track) x number of heads x number of cylinders.

VESA

Video Electronic Standards Association

Voice Coil Motor

An electromagnetic positioning motor in the hard disk drive similar to that used in audio speakers. A wire coil is placed in a stationary magnetic field. When current is passed through the coil, the resultant flux causes the coil to move. In a disk drive, the CARRIAGE ASSEMBLY is attached to the voice coil motor. Either a straight line (linear) or circular (rotary) design may be employed to position the heads on the disk's surface.

Wait State

When two devices are communicating, for example a CPU and memory, or memory and an I/O device, it is often the case where one unit is faster than the other. When this is the case, the faster unit must be placed in an idle condition for a specified period of time for each cycle of the communication. When the faster device is doing so, it is said to be in a wait state.

Wedge Servo System

A certain part of each CYLINDER contains servo positioning data. Gap spacing between each sector contains servo data to maintain position on that cylinder.

Winchester Drive

A disk drive with a Winchester head and non-removable (fixed) disks sealed in a contaminant-free housing.

Write

To store data on a disk.

Write-Protect

To prevent a floppy disk from being overwritten by placing a write-protect tab over the notch on the side of the floppy disk (5 ¼") or setting the write-protect switch (3 ½"). When a floppy disk is write-protected, you cannot erase, change, or record over its contents.

ZEOS

Greek God of Computers.

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